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SOME ECONOMIC ASPECTS OF
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SOME ECONOMIC ASPECTS OF WATERWAY PROJECTS

Haywood R. Faison

Introduction

At the time of the founding of this Society in 1852, inland waterways that had served to open the interior of the country to development were in the heyday of their dominance of the transportation field. But they were soon to encounter the feeble beginnings of a type of competition that, fostered by liberal financial support and freedom from effective regulation, was to constitute the first successful challenge to their supremacy as avenues of commerce. The railroads, which got their start as feeders to the waterways, had found the easy gradients along the banks of our main rivers ideally suited to their extension and interconnection into trunk lines of their own. The inherent superiority and wider accessibility of rail service was already beginning to make inroads into the high class passenger and freight service of the packet boats. Freedom to practice unlimited discrimination in charges for their services among shippers and localities in competition with the boat lines was laying the foundation for the subsequent annihilation of river transportation, and incidentally saddling upon the country the inequities of the freight rate structure that have endured in considerable measure to this day. It was not until twenty-five years later that the first practical steps were taken to protect national commerce against unrestricted exploitation by the carriers, through establishment of the Interstate Commerce Commission.

Federal improvement of the inland rivers for navigation continued, however, on a moderate scale to receive legislative sanction for another twenty-five years with apparently more consideration being accorded the political than the economic aspects of the projects. It was not until this Society had been in existence for half a century that Congress created the Board of Engineers for Rivers and Harbors with independent power and obligation to review all examination and survey reports on navigation projects, "having in view the amount and character of commerce existing or reasonably prospective which will be benefited by the improvement; the relation of the ultimate cost, both as to construction and maintenance to the public commercial interests involved; the public necessity for the work and the propriety of its construction, continuance or maintenance at the expense of the United States".

A quarter of a century ago, at a meeting of the American Society of Civil Engineers in Asheville, North Carolina, the business manager of McGraw-Hill publications aptly voiced the concept of the responsibilities of the civil engineer long held by our membership. He pointed out that the design and erection of structures that would not fall down or wash out or cave in was the simplest part of the engineer's problem, which under ordinary safeguards, could more or less be taken for granted. He maintained that the higher demand on professional experience and technical ingenuity required engineering plans and performance to provide for the best, the most efficient, and the most economical use of available capital in accomplishing the desired purposes. The question he said, was not merely - "Will it stand up?" - but - "Will it pay?". He

emphasized how important it was to avoid the irrevocable fixation of potentially useful money, especially public money, in projects which had not been thoroughly analyzed for economic soundness. He was convinced that the general public rightfully looked to the civil engineer for that kind of guidance, and that the profession unquestioningly accepted the obligation.

By and large it is believed that the performance of the great force of engineers employed on Federal public works in the field of practical economics has satisfactorily measured up to this standard of responsibility. There is no great line of demarcation discernible among the various groups of engineers in the several departments as regards professional training, talent or principle. Their interests are centered on different ends and they have their sharp differences of opinion as to the relative importance of their various objectives. These differences are becoming more and more the subjects of wholesome discussion and compromise and are being thrashed out in regular inter-agency committee meetings. The participating engineers have more or less the same professional backgrounds and conform to the same engineering standards; - have been trained in the same schools and traditions. In fact as a practical matter of careers, it has been found that the personnel of the various departments are more or less interchangeable. Under the prevailing circumstances, it is hardly conceivable that one large group should be guilty of all the possible professional shortcomings and misdeeds to the exclusion of all of the other similar groups. And yet that is what a large number of articulate and vociferous critics of the waterway development program would have the public believe.

This is not to say that no mistakes have been made or that no better methods or tests for soundness of the projects can be devised. Constant practice and experimentation have been improving the techniques of investigating, planning, estimating and constructing our waterway projects for many years and will continue to do so. The problems of coordinating the various desirable purposes within the national water resource development program have become increasingly complex, as have the problems of coordinating the various modes of transportation into an integrated system making the best use of the inherent advantages of each medium. These problems have challenged the best minds of the nation to an increasing extent for the last 25 years. This paper does not purport to offer solutions to all of them.

Engineers vs. Economists

During the last quarter of a century, however, there has grown into prominence a branch of the profession of Pure Economics that undertakes to solve all of these problems by the application of a number of somewhat abstract and radical theories and a new glossary of words descriptive of the process. Their approach seems to differ from the engineers mainly in reliance on reference libraries for the basic information in the absence of first-hand experience or knowledge of the engineering problems involved, rather than on down-to-earth practical contact with the harnessing of water resources or the business of carrying goods in commercial transportation. For some reason not entirely clear, this school of economists has singled out and set a vogue for concerted critical attack on all of the analytical methods, findings and accomplishments of the Army Engineers in their administration of public works, largely to the exclusion of other groups of engineers similarly engaged. As they are omnivorous readers and diligent transcribers, this critical bibliography has grown into a cumulative flood of censure. Their reports, articles and books have

followed closely, one upon the other, each author compiling and quoting the allegations of his predecessors, sometimes adding new ones of his own, without apparently, any very diligent effort at verification. In some respects they seem to enjoy an astonishing immunity to the impact of cold, hard facts but since the bulk of their criticisms have gone unanswered by those in a position to refute them, many of the allegations by frequent repetition, have gained public currency as facts more by default than by any proven validity. That this situation is resented by the profession-at-large is indicated by the following excerpts from an editorial appearing in Engineering News-Record for November 29, 1951 (p. 21): -

"During the past few months no less than three congressional committee attacks and a critical book have been directed against the civil works activities of the Corps of Engineers. x x x

"Silence in the face of these criticisms is not in the national interests, and is, moreover, damaging to the standing of the civil engineering profession. The fact that the criticisms are in many respects unfair and in others not factual makes the silent acceptance of them surprising as well as to be regretted."

The position of the author of this paper coincides with the editorial opinion voiced in the Engineering News-Record, which he accepts as an ear-to-the-ground report on the reaction of the civil engineers of the nation. If it is in conflict with the position of representatives of the Corps of Engineers on this panel, it can be offered in extenuation, that these are the independent views and observations of the author and do not necessarily imply acquiescence of the Corps.

It would seem highly desirable in the interest of harmony that the program of papers presented at this Centennial meeting of the Society avoid acrimonious controversy and emphasize the mutually shared technological progress that has marked the past century of professional achievement. Unfortunately, the matters set out in this particular paper have to be brought into the open and thrashed out, even though they are highly controversial. The railroads and their financial backers constitute the principal opposition to waterway development. There is nothing culpable about that. In view of their competitive position their attitude is natural and logical. Their interests however, do not necessarily coincide with the public interest, which is the concern of the engineers in charge of waterway development. Their criticisms of the engineers' methods have been direct, candid and specific. Some critical publications have not hesitated to allege bias and ascribe motives. They call for no less specific and objective refutation. It is felt that engineers responsible for the administration of river and harbor development program have carried forbearance under invalid criticism too far. The task of refuting some of the most ill-founded allegations has been appropriately dealt with in the papers of others on the panel. There are however, certain not-so-obvious fallacies familiar to this author because of his close association with particular phases of the problem, that have unjustifiably won popular acceptance through the mere weight of constant unchallenged repetition. His choice of topics has been frankly selective in order that the most flagrant, and hence the most vulnerable misstatements may be disposed of. It is to point out weaknesses in these criticisms, from an engineering viewpoint, that the preparation of this paper has been undertaken.

Traffic Estimates

Probably the least warranted and most easily disproven, and yet the most universal indictment brought against waterway engineers is that of over-optimism in estimating the volume of future water-borne tonnage for proposed navigation improvements. In his monumental work in the Federal Coordinator's "Public Aids to Transportation", the Director of the Research Department, an eminent transportation economist of exceptionally broad viewpoint, nevertheless indicates in his highly critical statements his belief that the tonnage forecasts of the engineers were for the most part over-estimated.

Public Aids - Volume III, pages 207-208

"The commercial canvasses and economic surveys are not nearly critical enough. The Board of Engineers and its staff have not been equipped with trained traffic men and economists to an extent that would assure a sound appraisal of the ever enthusiastic claims of waterway advocates or to make comprehensive independent analyses. The contributions of the Board of Engineers to the engineering phases of waterway improvements and flood control have, of course, been of the highest order, but economic questions having such broad ramifications as a major waterway project require more varied expert talents than have been available."

Again on page 115, Volume III of the Coordinator's report:

"This skepticism arises from the fact that in many instances these waterways have not developed the volume of traffic which had been anticipated."

The Director's skepticism was based on a per-ton-mile evaluation of the waterways in 1936 when a number of them were still in the construction stage. A comparison of the growth of traffic on six typical waterways from 1936 to 1950 is shown in the following tabulation:

Project	Water-borne Ton-Mileage	
	1936	1950
Upper Mississippi River	154,130,000	2,220,513,000
Lower Mississippi River	3,477,489,000	13,518,732,000
Ohio River	2,652,870,000	8,800,451,000
Kanawha River	88,381,000	325,747,000
Cumberland River	63,818,000	229,634,000
Illinois Waterway	174,875,000	2,734,327,000
TOTAL	6,611,563,000	27,829,404,000

Although the Coordinator's report was compiled during a period when some of the major waterways were still in the development stage of modernized improvement, and insufficient time had elapsed for the attraction of prospective commerce, the remarkable growth of traffic on the waterways during the ensuing years has shown, in contrast to the charge of critics that forecasts of future traffic have been greatly over-estimated, that in many instances the forecasts, in fact, were over-conservative, as may be seen from the following table:

**Ton-Miles of Inland Traffic on the
Mississippi River System**

<u>Year</u>	<u>Ton-Miles</u>
1934	5,872,777,000
1939	9,896,943,000
1944	19,004,643,000
1950	30,281,638,000

Practically all of the criticisms of the waterway development program rest on the fallacy, disproven by factual record, that prospective water-borne traffic has not developed as anticipated by the engineers. Notwithstanding the facts revealed by commercial statistics, many of the more recent censors still persist in adhering to the discredited assumptions of the earlier critics, as shown in the following excerpts: -

"Transport Facilities, Services and Policies" by the Professor Emeritus of Transportation and Commerce, University of Pennsylvania - 1947. p. 319:

"The (Illinois) waterway is being enlarged at the expense of the Federal Government, **ALTHOUGH THE TRAFFIC USING THE WATERWAY HAS THUS FAR BEEN LESS THAN EXPECTED**".

The enlargement operations extended from 1933 to 1939, when the 9-foot channel was finally secured. The report of 1933 estimated a prospective volume of freight of 8,330,000 tons annually when water-borne commerce had matured. The traffic was only 257,000 tons in 1934, but had attained 7,677,000 tons or 92 percent of the predicted volume by 1944 and in 1947, when this book was released, had passed the volume of traffic forecast by 20 percent. (It had doubled by 1950). In view of this trend, publication of the quoted passage indicates an astonishing disregard of the facts.

"Muddy Waters", by an Assistant Professor of Government at Harvard, 1951: -

"On the whole the Engineers have been overoptimistic in their estimates of waterway traffic. According to a report of the Federal Coordinator (1939) in certain areas it would require more traffic than moves by all agencies of transport combined to bring waterway use up to effective working capacity."

x x x x x

"The staff of the Board of Investigation and Research, after careful review of waterway use statistics - (1938 and 1940) - concluded that 'results attained on individual waterways are occasionally better - but more often worse - than predictions contained in the traffic estimates.'"

And these conclusions of 1938 to 1940 were passed along to the public as authoritative in 1951, with no apparent effort at verification to see if they were factually supported.

A report of the Secretary of Commerce on the issues involved in a "Unified and Coordinated Federal Program for Transportation" in December 1949 said with regard to reports of the Engineers on waterway improvements: -

"For purposes of this report, no survey has been made to determine whether the anticipated benefits from particular projects have actually materialized, although there is a general impression that, in many cases the traffic which subsequently developed on the waterway was far less than that assumed when the project was recommended."

It is to be regretted that lack of time prevented verification of the popular but threadbare allegations of earlier investigators, that were thus given further impetus.

The office of the Federal Coordinator of Transportation ceased to exist in June 1936. Tentative reports were in an advanced stage of completion. His office under the law was supported by assessments on the railroads of the country. This law provided that any unexpended balance remaining at the termination of the office should be returned to the railroads. The railroads were requested and agreed in general to permit the use of this fund in completion of the research studies. \$15,115.36 was so used and the report was completed and published. It was the source of the above-quoted stricture on the capacity of the Board of Engineers for Rivers and Harbors and its staff to make comprehensive independent analyses of waterway projects. The "Prefatory Note" to this volume by the Director of Research acknowledges the outstanding services rendered by eight traffic and transportation specialists and economists on his staff. A typical circumstance bearing on criticisms of this kind is that, when this report was published in 1939, three of the eight specialists thus given special acclaim had been members of the staff of the Army Engineers for two years. Later, after the Board of Investigation and Research into transportation was disbanded in 1944 the services of two of its top transportation economists were also secured for the River and Harbor Board staff. Nevertheless, the original criticism, penned in 1937 before the establishment of the economics division of the Board of Engineers, has been avidly quoted and repeated in the works of most of the subsequent critics up to the present time. In addition to the examples quoted above, it was cited by an official representative of the Transportation Bureau of the Department of Commerce as late as 1950 in a memorandum for the President's Water Resources Policy Commission. This was in connection with a recommendation for transferring final responsibility for economic evaluation of navigation projects to the Department of Commerce. Another odd circumstance overlooked or ignored by that particular critic is that, at the time the original criticism was being drafted for the report of the Federal Coordinator before the establishment of the Economics Division of the Board of Engineers for Rivers and Harbors, the Department of Commerce was being employed by the Corps of Engineers to make the surveys and estimates of prospective traffic and savings for its important waterway projects. These evaluations were being made on a mechanical rail and water rate comparison, and embodied most of the other features of analysis which were so disturbing to the Commerce Department's own economists in 1950.

It was cited in the book "National Transportation Policy" by two economists of the new order published under the auspices of the Brookings Institution in 1949. It was intended as a guide for the Hoover Commission's reorganization plan but is understood to have been rejected by that body. This book furnishes additional examples of the acceptance of obsolete criticisms, unverified for current applicability. The attitude of its authors can be summarized by quoting a passage from the final chapter on "Reorganization of Federal Agencies":

"Because of the multiple operations of the Corps of Engineers in the field of water resource development however, it is not suggested that the Corps itself be transferred to the Department of Transportation. x x x "all navigation projects should be reviewed by the Transportation Department to determine the economic desirability x x x

**"THE HIGHLY QUESTIONABLE ECONOMIC JUSTIFICATION OF A
LARGE PART OF THE FEDERAL GOVERNMENT'S RIVER AND HARBOR**

DEVELOPMENT PROGRAM HAS BEEN POINTED OUT REPEATEDLY IN STUDIES OF TRANSPORTATION. THE FACT THAT SEVERAL HUNDRED MILLION DOLLARS ARE COMMITTED EACH YEAR TO INLAND WATERWAY IMPROVEMENTS, MANY OF WHICH COULD NOT CONCEIVABLY BE JUSTIFIED FROM A TRANSPORTATION VIEWPOINT, is one of the most serious indictments of Federal transportation policy."

These allegations simply do not conform with the recorded facts.

Contrary to the impression given by numerous critics it is only within the past 25 years that definite forecasts of volume of commerce and magnitude of transportation savings have been incorporated in the published reports of the engineers on proposed navigation projects. Among the major waterway projects that have been completed and in operation long enough for water-borne commerce to develop, only five were authorized on the basis of specific estimates of future traffic. Their actual performance records are as follows:

Project	Results of Improvement			
	Traffic	Forecast	Traffic	Developed
	Year	Tons	1950	Tons
Upper Mississippi	1930	9,000,000		11,025,000
Gulf Intracoastal	1945	7,000,000		18,971,000
Illinois Waterway	1933	8,330,000		16,421,000
Kanawha River	1931	2,300,000		6,388,000
Ohio River	1910	13,000,000		48,598,000

Unfortunately, the mere fact that time has proven the engineers right and the earlier critics wrong in this respect does not appear to have exerted any deterrent effect on later censors. When it is recognized that this barge-borne tonnage has materialized, despite the employment of every competitive device accessible to the railroads to prevent its growth, the inherent utility of this means of transportation is evident.

Method of Evaluation

Surveys to reveal potential traffic and probable savings in transportation costs which will be made available by a proposed navigation improvement are usually coordinated with surveys to determine the most suitable plan and estimated cost of the project. It is thus possible by mutual adjustment to arrive at the optimum compromise between standards of improvement and desirable objectives. Information as to prospective commerce is obtained through statistical studies of production, manufacture and marketing, freight waybill sampling and by direct contact with both potential users and competitors of the proposed water route through hearings and field canvasses. Current scales of transportation charges from primary origin to final destination are compared with estimated charges including necessary transfers that would be remunerative to water carriers and their connections under the proposed conditions. Potential commerce thus developed is screened for volume, demand, accessibility, adaptability to water movement, and the magnitude of prospective benefits is computed by applying the unit savings derived as described above. The probable annual benefits are then compared with the estimated cost of construction, operation and maintenance reduced to an annual carrying charge to determine the ratio of benefits to costs. The purpose of the canvasses is not so much to disclose the temporary traffic and transportation conditions of the current period as to develop the firmest possible trends upon

which to base logical forecasts of conditions bearing on the usefulness of the projects under investigation throughout the period of their useful life.

If the method used to estimate benefits were as simple as alleged by some critics of waterway development, a good calculating machine would suffice to carry the above-described analytical processes to the proper conclusion. On the contrary, there are many more complex aspects of the problem that have to be resolved by trained and experienced traffic and transportation specialists before a valid decision can be reached. The need for more economical transportation must be established. The effect of the project on existing transportation agencies and their probable reaction to the competition have to be considered from the public viewpoint. Commercial data secured from local interests has to be critically scrutinized for overly optimistic or pessimistic predictions in the light of conditions revealed by the field canvass. For the past twenty-five years in particular the technique of traffic analysis has been constantly revised and perfected in accordance with progressive thought among the agencies concerned with the national transportation problem. The trends in agricultural, industrial and commercial activities of the areas tributary to proposed improvements have had to be developed and their influence on the pattern of commodity movements taken into account.

Personnel

For this purpose there has been progressively built up within the staff organization of the Board of Engineers for Rivers and Harbors during the last quarter of a century a mobile group of technically trained transportation specialists of broad and responsible experience in dealing with practical traffic problems pertaining to waterways in their relation to the collection and distribution of basic commodities and to other modes of carriage in the national transportation network. Included among these seasoned specialists are licensed practitioners before the Interstate Commerce Commission, certified cost accountants, transportation analysts of national reputation, tariff computers, economic geographers, with practical experience in, or contact with, barge-rail and barge-truck and terminal operation, as well as engineers practiced in the coordination of structural and economic surveys and analyses of navigation projects. This staff is maintained to furnish guidance and assistance to the district offices in the organization and conduct of field canvasses, analyses and evaluations of data secured from shippers, carriers, producers of raw materials and fuels, manufacturers and consumers on the most important waterway projects. They maintain investigative relationships of mutual confidence with operators of the leading common, contract and private waterway carrier lines, and are recognized and consulted by most public agencies as disinterested and authoritative sources of information on vessel operating practices, costs and related fields. Great pains have been taken to gather the ablest personnel obtainable in this particular field. After all the data have been collected, screened and tabulated, it is the experienced judgement of these men that derives the most reliable answer from the available material.

One of the problems which tax the judgement and tact of the field investigators is the traffic furnished by interested persons in the potential tributary area in the light of conditions disclosed by field canvass. Shippers are naturally optimistic in their estimates. They want as many alternative means of transportation available to them as possible, especially if the cost of providing the facilities is borne by the Federal Treasury and not by local interest. Communities without direct access to inland waterways observe that other communities so favored have the advantage of freight rates adjusted to meet

low-cost water transportation. That is the source of much of the promotional activity for extension of the waterway system. It is not however, a guarantee that the facilities thus provided will actually be used to the capacity indicated, after competitive adjustments among the carriers have been made. Profitably established carriers by the various modes of transportation, including existing waterway routes frequently prefer the status quo to conjectural benefits that may result from enlargements or extensions of navigation facilities that bring with them the possibility of competition from new sources. It is a phase of the familiar problem that engineers are constantly required to arbitrate between the claims of two factions, both fundamentally honest and trying to be fair, but with their viewpoints colored by their opposing financial interests in the outcome. The investigators have to weigh the conflicting evidence tactfully in the light of the public interest which does not always correspond with either of the opposing viewpoints. In addition to those unfavorably reported upon, many proposed improvements fall by the wayside before reaching the stage of formal reports because of expert screening of their economic merits in the preliminary examination stage.

Validity of Navigation Savings

Looking back over the comparatively short period since the Federal government embarked on its program of modernized improvement of inland rivers, two aspects stand out in prominent relief; - the remarkably rapid growth of inland waterway commerce on the one hand, and the insistence of waterway opponents that the benefits are illusory. They claim that barge operators could not offer service at rates providing substantial savings under those of alternative modes of transport, if the navigation facilities were not furnished to them without cost. Otherwise, they say, very little traffic would be attracted to the waterways. This claim is not borne out by recorded facts. As will be shown in a current analysis of the performance of leading inland waterways, the annual savings in transportation costs far exceed the annual charges for improvement.

Actually the genesis of specious arguments of that sort may be traced back some 16 years to the appraisal of inland waterway improvements in the report of the Federal Coordinator of Transportation, either in their incompleteness or at a stage of development retarded by the business recession of that period. But opponents of the potentially serious competition with other forms of transportation avidly seized on this circumstantial analysis as effective ammunition in a campaign calculated to discredit the navigation program before it had a chance to prove its inherent value. The wide publicity given to these figures, by frequent repetition, took on the appearance of authority and fact. Many of the more gullible transportation analysts of recent years have been led to base their conclusions in regard to the merits of inland waterways upon these premature conclusions of the depression era, when barge-borne commerce was but a small fraction of its present volume.

Illustrative of the manner in which this basis of evaluation unfairly disparages the economy of waterway transportation is the method of appraisal appropriated from the Federal Coordinator by the Board of Investigation and Research into Transportation in their 1944 report, and by busy transcribers among the authors of much later treatises on the subject. This method applies the annual cost of improvement, which of course is greater during the early years of development, to the volume of traffic that has developed at the time. The Coordinator's report even matched the expenses for the fiscal year ending

June 30th to the traffic for the preceding calendar year, which by no sort of economic gymnastics could be expected to benefit by improvements made six months after it moved. For the purpose of revealing the distortion that results from such a method of appraisal it is sufficient to refer to the history of the Illinois Waterway. This waterway was officially opened for 9-foot navigation in 1933, although that controlling depth was not secured until 1938. The engineers estimated an eventual matured annual traffic of 8,000,000 tons. The Federal Coordinator's evaluation of this waterway was based on conditions obtaining in 1935 when the total traffic was 620,313 tons, which amount was used in comparison with annual costs, six months later, to obtain the unit rating of this waterway in cost-per-ton-mile. However, during the ensuing years between 1933 and 1950 the traffic on this waterway steadily increased in volume as anticipated in the engineers' original report, practically attaining their original estimate by 1944. In 1950 it amounted to over 16,000,000 tons while the unit cost of boat line operation, responsive to technological advances in the design of equipment and this ample reservoir of tonnage, dropped to an all-time low in mills per ton-mile. Thus the differential between barge rates and rates by alternative routes, which represents savings to the shippers, has continued to increase with the growth in volume of traffic. The Federal cost-per-ton-mile in 1950 for handling this large volume of traffic was less than one-fourteenth of the unit cost assigned by the Coordinator's staff as an indication of the economic value of this waterway.

It makes an interesting commentary on this whole investigation of the justification of public aids to transportation by water, that the Federal Coordinator risked the following conclusions on the basis of his findings in 1936:

"Generally, the forecasts of traffic that would move over rivers and canals have exceeded by wide margins the traffic which actually developed, even with due allowance for the period required to develop traffic after waterway improvements have been completed. x x x Past experience indicates that in the future estimates will continue to require substantial discounting for overestimating."

The truly remarkable fact is that the significant upset in the Coordinator's forecasts has apparently escaped the notice of the critical transcribers who depend upon others to dig up the basic facts for their economic treatises.

In 1941, the Chief Economist of the Association of American Railroads quipped:

"Like many prophets, the (waterway) traffic prophets proved to be wrong."

But not for long, as evidenced by the growth of traffic in the ensuing decade.

In their book on "National Transportation Policy" in 1949, the two economists with the Brookings Institution previously referred to, still rested their conclusions on the Federal Coordinator's report of 1939 and on: -

"Some indications of waste of general tax funds resulting from the overenthusiastic development of waterways provided by the public aid studies of the Board of Investigation and Research."

The B.I.R. studies were made in 1942 on water-borne traffic for both 1940 and 1938. The investigators regarded 1940 figures as too far out of line on the high side to be representative. Actual statistics of waterway-borne commerce current when "National Transportation Policy" was written however, more than doubled the ton-mileage for 1940 and almost tripled the 1938 figures,

effecting a corresponding drop in the unit cost of improvement. With clear proof available to the authors that the basis of their findings as to over-estimated traffic forecasts was no longer valid, their publication in 1949 seems inexcusable. The factual evidence would seem to indicate that the engineers know better than the theorists what to do about the navigation improvement program and how to do it.

Rising Construction Costs

The most controversial waterway projects have purposely been selected for discussion in this paper because each one exemplifies one or more elements in the prevalent pattern of criticism and its weakness. This is not meant to imply that all of such projects are necessarily considered justified under present conditions. The unprecedented rise in the prices of materials and man-power characterizing the post-war era, coupled with the remarkable drop in productivity of migrant labor on heavy construction as compared with those steadily employed, have completely upset the previously established balance between costs and benefits. It would have required almost super-human prescience to have anticipated these trends, and the Corps of Engineers is by no means alone in having underestimated them. Some ambitious projects, previously recommended, have recently been unfavorably reported upon, and others are being held in abeyance under a procedure resembling the pocket veto, awaiting a firmer stabilization of outlook than is possible under current conditions. These adverse trends have, however, provided the critics with a field-day for "second-guessing" of which they have not been loathe to avail themselves.

Competing Projects

Frequently, betterments to waterway projects, instead of involving the widening or deepening of existing channels or the increase of lock dimensions, take the form of completely new by-pass channels which create advantages such as savings in vessel operating costs to water-borne traffic that already enjoys some measure of navigation improvement on the old channels. A simplified example is the lateral canal now nearing completion by-passing the dangerous reach of the Mississippi River known as "Chain of Rocks" above St. Louis, Missouri. As its name implies the river here flows for about ten miles over a series of rock reefs that have always constituted a troublesome obstruction and hazard to navigation. Improvement measures had been carried on in the main river channel at this locality for many years, since the days of the pre-Civil-War operations of Major Robert E. Lee, finally yielding dependable controlling depths of about seven feet, constituting a bottleneck in a system otherwise affording 9-foot depth. A substantial through barge traffic was gradually built up that has made increasing use of this channel between the Ohio and Lower Mississippi sections of the waterway system on the one hand and the Illinois, Missouri and Upper Mississippi sections on the other. Without doubt, the benefits to this traffic have been justly cited as warranting former expenditures for improvement and maintenance of the river channel at this point.

Chain-Of-Rocks By-Pass Canal

Repeated attempts to establish the standard controlling depth of 9 feet over these dangerous shoals, needed to facilitate through commerce between the

sections above and below St. Louis, resulted unfavorably. A dependable 9-foot by-pass canal around this bottleneck, which had long been advocated by the engineers, was finally authorized and adopted by Congress. The benefits provided by previous improvement works in the main channel, now enjoyed by existing traffic, will be duplicated in the new by-pass canal. In addition, the new project will facilitate the operation of barge tows loaded to standard depths, instead of having to be light-loaded as now to negotiate the Chain-of-Rocks reach, resulting in very substantial incremental savings in transportation costs all the way from origins to destinations on distant parts of the system. The benefits now provided in the main channel (and preserved in the new canal) are properly being charged off against the corresponding cost of the old works, and only the additional savings from the increased draft used in justification of the by-pass canal improvement. These are more than ample to warrant the expenditures made on the improvement. Not even the most exacting critic of the engineers has challenged the soundness of justifying the by-pass canal project on the basis of incremental benefits or has claimed that the costly blasting, dredging, and contraction works that would be required to maintain the river channel over the Chain-of-Rocks ought to be continued because of its former usefulness.

Diversion of Upbound Mississippi River Traffic

In 1939 and again in 1945 the engineers proposed provision of a waterway connection between the Tennessee and Tombigbee Rivers which would provide a canalized route between Mobile on the Gulf Intracoastal Waterway and Paducah on the improved Ohio River. This canal also would connect northern and southern portions of the waterway system. The Board of Engineers for Rivers and Harbors accepted as part of the justification of the project, the savings estimated to result from diversion of a portion of the through upbound traffic from the open Mississippi River channel to the connecting canal route. In 1939 it was found that a through upbound movement of 925,000 tons per annum between New Orleans and the mouth of the Ohio River could be diverted from the adverse current of the open river to the slack water of the Tennessee-Tombigbee route at annual savings in round figures of \$1,000,000. Upbound tonnage on the Lower Mississippi continued its steady increase from 2,955,479 tons in the calendar year 1938 to 11,027,584 tons in the calendar year 1944. The central statistical control office at St. Louis was called upon to run off the figures representing the through tonnage for each year, resulting in a volume of 3,066,000 tons which could be taken as divertible in the 1945 report. Because of an observed trend toward increased speed and power of tow-boats engaged in certain specialized services, manifested during the six-year interval, the savings in vessel operating time and cost estimated to result from use of the alternative northbound route was put at \$1,200,000 a year. The estimate of savings from the proposed diversion raised only 20 percent over the 1939 figure instead of the 200 percent indicated by the statistics of actual commerce in 1945, represented the conservative judgement of the water carrier specialists on the Board's staff. They were inclined to discount the sharp increase of the war years, and believed that the trend toward streamlining and integrating of tows in specialized services tended to minimize the operating time and cost differential between the two routes so as to render the proposed canal unattractive as an upbound route to certain new types of traffic. The attention of readers is invited to the above-described estimating procedure and figures, both clearly set out in the report, itself, because of the adverse comments of critics to be quoted in a subsequent paragraph. It is to be noted that

no rate comparison is involved; merely the saving in time, and consequently in operating costs of the same equipment on the alternative routes, and thus only the incremental savings provided by the proposed route as compared with the existing route were used in justification of the Tennessee-Tombigbee connection. As stated in the report, page 175

"The propriety of claiming savings on tonnage diverted to the proposed improvement is apparent when it is considered that the traffic already enjoys the benefits of water transportation and that it is only the incremental savings in distance and time that are credited to the connecting waterway project."

The author of "Muddy Waters", and the investigative staff of the House Appropriations Committee, among others, were highly critical of the use of the incremental savings principle in justifying this proposed waterway. In the chapter of "Muddy Waters" on "Responsibility to Profession" the author points to the Tennessee-Tombigbee project as an example of unsound engineering for projects that compete with each other for the same traffic. He records the concurrence of the Board of Engineers for Rivers and Harbors in the item of estimated annual benefits in the 1939 report of \$1,000,000 from traffic to be diverted, and the doubts expressed by the Chief of Engineers of its wisdom. He continues:

"After the Congress rejected the project on the basis of the 1939 report, the Board of Engineers for Rivers and Harbors made a re-examination (in 1945) in order to bring up to date the data with respect to economic benefits. x x x The allocation of annual benefits from savings to upbound Mississippi River traffic to be diverted to the Tombigbee waterway was revised upward to \$1.2 million. This time, the Chief of Engineers interposed no objection to the consideration of this annual benefit, without which the project could not have obtained a favorable cost-benefit ratio. He stated, 'in addition, traffic already moving advantageously upstream against Mississippi River currents will be able to use the new waterway at additional savings estimated at \$1.2 million, annually.'"

x x x x x

"Congress (had) turned down the Tennessee-Tombigbee in the Rivers and Harbors Bill of 1945 (on the basis of the 1939 report) and the debate reveals that in doing so it in effect rejected the benefits claimed for national defense. Thus in the reexamination of the waterway conducted by the Board of Engineers in 1945, all of the imponderable benefits of national defense, land enhancement, or recreation, which had been rejected in the previous report were eliminated. IT WAS THIS ACTION WHICH COMPELLED ALLOCATION OF GREATER BENEFITS TO UP-BOUND MISSISSIPPI RIVER TRAFFIC, REFERRED TO ABOVE."

Readers of this paper are urged to ponder the implications in the above concluding sentence in the light of the statistically supported facts reproduced in an earlier paragraph, herein, and clearly set out in the report itself.

The criticism continues:

"For reasons not known, the Bureau of the Budget did not hold the new proposal contrary to the President's program, and the Congress authorized the waterway in the Rivers and Harbors Act of 1946 x x x The Corps had no doubt used the upbound Mississippi traffic to justify the improvement of that (Lower Mississippi) river."

The above comment typifies persistence among critics to ignore the growth of water-borne commerce. They cling to the thesis that there is only a fixed volume of traffic, and that growth on one route must be offset by an equal shrinkage on some other route in spite of the overwhelming statistical evidence to the contrary throughout the history of industrial and commercial development of the interior of the country. It was not the divertible traffic that was used to justify the improvement of the Lower Mississippi River for navigation. As a matter of record the annual increase in traffic on the Mississippi River between New Orleans and the mouth of the Ohio River from the date of the 1939 report to the present has averaged more, each year, than the entire estimated diversion to the Tombigbee route. Ignoring altogether the benefits enjoyed by downbound traffic on the Lower Mississippi River, justification for expenditures on the navigation features of that improvement would be substantially exceeded by savings on the scheduled local, upbound way-port commerce of the common carrier barge lines, alone, which service would continue altogether uninterrupted by through traffic diversions.

Incremental Benefits

Arguments on the above lines are beside the point however, in establishing the validity of the principle which is attacked in "Muddy Waters". It would make no difference in principle if the proposed diversion took every ton of commerce from the Lower Mississippi River and consigned that improvement to abandonment. If the Tombigbee route were better - were enough better to pay for itself in additional benefits - the project would be justified. There is no fundamental difference in theory between diversion of present Chain-of-Rocks traffic to the by-pass canal, and Tennessee-Tombigbee canal route. Only here the by-pass, instead of being eight miles long would be 800 miles long. The diverted traffic would be afforded the benefits it now enjoys on the open Mississippi River, which are not counted in justification of the connecting canal, but are in effect charged off against the improvement of the open river. The diverted traffic would enjoy additional benefits in the saving of distance and time reflected in vessel operating expenses via the new route. These additional, incremental benefits are properly creditable to the proposed improvement. The same theory applies to the replacement of an icebox with an electric refrigerator. Emphasis is given to it here, because it is intended, in this paper, to invoke the principle in a broader application to other current criticisms of the waterway improvement program.

Economic Results of Improvement

Of the 28,000 miles of improved channels shown on the waterway map, only about 9,000 miles comprise the interconnected inland and intracoastal system with facilities improved to modern standards, upon which barge service has become firmly enough established to be an important factor in domestic transportation. It is this system upon which most of the money has been spent and most of the tonnage is carried. The fact that the engineers' forecasts of traffic volume expected to develop on these waterways have been substantially exceeded in actuality is confirmed by the steadily increasing annual ton-mileage figures shown on the graph at the end of this paper. That this growth has taken place under adverse circumstances is attested by the Federal Coordinator of Transportation in his pioneer report on "Federal Aids" - 1940: -

"They, (advocates of waterways), point out that when such a waterway is opened and water carriers begin to use it, immediately competing modes of transportation, particularly the railroads, reduce their rates, thus depriving the waterway of traffic it would otherwise carry. It is true that the results of construction and improvement of waterways are as they describe."

The Assistant General Counsel of the Association of American Railroads in his testimony on Senate Resolution 50 - 1950 - explained: -

"In the effort to prevent traffic diversion, (rail) rates on commodities that are most vulnerable to competition will tend toward 'out-of-pocket' costs."

Commenting on this universal practice of rate depression the Chairman of the Interstate Commerce Commission, in the Petroleum case (235 ICC 115) - 1939 - said: -

"The railroads will have a new hole in their revenues which they must fill at the expense of some other traffic."

It is worthy of note that the water-borne ton-mileage shown on the graph referred to has been built up despite the above-described practices of competitors. It has been attracted to water routes in preference to land routes by the differential between competitively depressed rail rates and compensatory water carrier service charges which do not include improvement costs.

The report of the volunteer Engineers Joint Council on "National Water Policy" - 1950 - dismisses the remarkable growth of water-borne commerce under these conditions with the following observation: -

"Since the general taxpayer provides and, maintains, free of charge, the right-of-way on which the inland waterway operator conducts his business, and since the subsidy payments show a sharp upward trend, it is not surprising that traffic on these artificial channels show an impressive increase in recent years."

The Council proposes this somewhat unrealistic remedy: -

"By imposition of a system of toll charges, the margin between waterway costs and rail rates would, in many cases, be eliminated or substantially reduced. In such cases a large part of the traffic would abandon the waterway. x x x

In consideration of the imposition of user charges equivalent to the complete cost of waterway transportation, the railroad rates should likewise be (made) compensatory."

The personnel of the Council's Task Force Committee on inland waterway transportation comprised a group of eminent business and professional men. It is difficult to account for the obvious inconsistencies between their findings and their conclusions except unavoidable haste and insufficient time for consideration of the facts brought out by their investigations, stressed in the foreword to the report. Parts of the report devoted to waterways give the appearance of having been farmed out to different individual students without subsequent coordination of the findings. However they may have been formulated, they indicate misconception or disregard of the competitive situation actually existing.

As a matter of common knowledge, the competitive rates available to waterway users via the alternative rail routes do not cover the costs of "right-of-

way" either, since they are depressed rates admittedly based on the "out-of-pocket" cost of handling added traffic to meet water competition. The rate differentials now actually in effect average substantially less than would be the differentials if competitive rail rates were held at the normal level (as recommended by the Council) and the water carrier costs were raised to include public improvement costs. This fact has been established in studies of going waterways made from time to time by the engineers, and exemplified in a brief analysis of the 15 most important projects of the waterway system made for the Engineers Joint Council Task Force Committee in 1950. These projects accounted for 80 percent of the total annual charges for all waterways and handled over 80 percent of all barge-borne freight, so they may be taken as reasonably representative.

The exhibit on the following page is submitted as giving a sufficiently accurate picture of waterway economics to dispose of many of the assumptions upon which opponents of the federal improvement program have based their criticisms.

In order to obtain as reliable a measure of the transportation savings earned on the 15 waterways in 1948 as possible, analysis was made of the principal commodities conveyed; representative cargo movements on each section and from one section to another, by both all-water and combination rail-and-water, were analyzed for comparison with the most economical available alternative routes, from primary origins to final destinations. The difference between the charges actually incurred by the shippers, including the extra transfer costs, and those that would have applied by the cheapest alternative route (in the absence of the waterway) were developed as unit savings. Full barge-line service costs plus a reasonable return on investment in equipment were used in place of barge line tariff rates because the great preponderance of water-borne freight was known to have moved by contract or in industry-owned carrier services, which did not establish rates. The unit savings thus derived for each of the selected waterway projects were applied to the ton-mileage of the sample commodity movements and the results tabulated in the center column of the following table, as indicating actual savings made in freight charges. This table represented, of course, the results of a sampling process, there being neither time nor funds for a complete analysis of each movement to meet the short time limit imposed. It is believed, however, to afford the closest approximation that can be made short of an exhaustive waybill analysis of each separate shipment. The significant figures are verifiable. Approved sampling methods were used by competent statisticians, to which were applied the experienced knowledge of a staff of traffic specialists and every effort was made to obtain a representative cross-section of waterway commerce. Improvement costs were reduced to annual charges from the detailed cost records dating from inception of the projects.

Notes to table: COMPARISON OF COSTS AND BENEFITS FOR YEAR 1948

- (a) Projects are currently under construction and present traffic is that which uses the waterway in spite of the interruptions occasioned by improvement activities - it is no valid indication of the economic value that the completed waterway will have in the integrated transportation system.
- (b) Improved to inferior standards which do not permit interchange of traffic with standard waterway system. Proposed enlargement pending.

Section of Waterway System	Charges for :Amortization :Interest & :Maintenance & :Operation	Savings in Cost of Transportation	Net Savings After Deduction of Waterway Costs
Lower Mississippi River	\$13,455,000	\$ 67,979,000	\$ 54,524,000
Middle Mississippi River	2,560,000	8,620,000	6,060,000
Upper Mississippi River	8,295,000	11,521,000	3,226,000
Ohio River	10,235,000	41,827,000	31,592,000
Monongahela River	1,344,000	19,913,000	18,569,000
Allegheny River	871,000	946,000	75,000
Illinois Waterway	2,128,000	12,094,000	9,966,000
Missouri River (a)	11,456,000	303,000	(-11,153,000)
Cumberland River	899,000	1,582,000	683,000
Warrior-Tombigbee Waterway	1,271,000	2,471,000	1,200,000
Quachita River (b)	315,000	22,000	(-293,000)
Gulf Intracoastal	4,068,000	55,270,000	51,202,000
Columbia River (a)	2,005,000	689,000	(-1,316,000)
Sacramento River	154,000	2,499,000	2,345,000
Kanawha River	1,026,000	1,981,000	955,000
TOTAL	\$60,082,000	\$227,717,000	\$ 167,635,000

As previously pointed out, the table limits the savings for each section of the waterway system to the amount saved on operations on that section alone. If the feeder value of some of the branch waterways had been figured on the basis of traffic contributed to the main stream, the savings would have been increased and those on the main stems commensurately diminished, so that the benefits would have been more uniform throughout. The estimates of savings differ from the various published analyses not only in reflecting the increased tonnages of later years but also in another significant particular. The normal fully remunerative level of rates was used in the comparison, rather than rates which had been depressed to uneconomic levels to meet existing waterway competition. This clearly gives the true measure of savings enjoyed by the shippers, who would have had to pay the normal rates, had not the water improvements been available. In all their proposals for applying user charges to waterway transportation to effect reimbursement to the National Treasury, the tests for economic justification laid down by the economists have been given the aspect of fairness, but it is evident that few projects were expected to survive the tests. The foregoing table indicates that the principal completed waterways not only have passed the tests, but are providing annual savings in transportation costs sufficient to pay off the annual improvement charges, leaving an ample margin for profitable operation of the water carriers, and for the attraction of an even greater volume of tonnage under the framework of a normal, fully compensatory rate structure, recommended by the Engineers Joint Council.

System Value

The foregoing analysis of typical sections of the existing waterway system compares the computed annual charges covering interest, amortization, maintenance and operation with the transportation savings earned on each component section separately. This is the only feasible means of measuring the economic results of improvement of completed individual projects without duplicating savings made in the transportation of through freight passing over two or more sections in its progress from primary origin to final destination. The method ignores the very important element of system value whereby, because of standard interconnection, freight can travel without transshipment in continuous voyages between such distant ports as Pittsburgh, Chicago, Minneapolis, Kansas City, St. Louis, Memphis, New Orleans, Mobile, Port St. Joe, Beaumont, Houston, and Corpus Christi. It would obviously be impracticable to credit the whole saving on a tow-load of industrial alcohol for instance from its origin at a refinery in Texas City to an anti-freeze manufacturing plant in Charleston, West Virginia, to the originating Gulf Intracoastal Canal because it might, by the same reasoning, be attributed to the existence of the terminating Kanawha River improvement. The only means of evaluating the element of continuity of the interconnected navigable channels is to treat the improved system as a whole. When the problem is to determine the probable economic justification of a proposed extension, enlargement, or cross connection, however, the element of system value can be given due weight.

Feeder Value

Official orders and regulations that have governed our procedure in arriving at estimates of benefits of a proposed navigation improvement for many years and are accessible in the stacks of most public libraries, contain the following stipulation:

"If the proposed improvement will develop new waterway movements that include increased traffic to existing waterways, the estimated saving for the complete water movement will be included as a benefit, and no part of such saving should be deducted on the theory that it should be assigned to the connecting waterway. On the other hand, when a proposed improvement will result in the extension of waterway movements already developed, only savings which result from the extension of the movements should be included as a benefit, and no part of the saving already being realized by movement on the existing waterway will be included as a benefit for the new improvement."

It is fundamental to sound analysis that proposed additions to existing improvements are entitled to credit for transportation savings on the traffic from origins to destinations, if, without the improvement, the traffic would move from origin to destination by other means or would not move at all. In other words, when a proposed extension or enlargement of a waterway is under consideration, the engineers are not concerned with the degree of justification attained by the completed portions of the system. They have to determine only whether the proposed addition will pay for itself in added benefits, whether they occur on the project, itself, or are contributed by the project to the system as a whole. This kind of benefit is, in transportation parlance, a measure of the "feeder value" of the project, and its comparative magnitude determines the justification of the proposed improvement. The question whether the completed waterway connections are or are not already earning savings sufficient for their justification is not involved. It is evident, however, that any proposed extension or enlargement that will swell the volume of profitable, long-haul, trunk-line traffic tends to increase the return on the public investment already made in the waterway system.

A typical reaction of waterway opponents to the recognition of "feeder value", in estimating benefits to result from navigation improvements, appeared in "Railway Age" in 1946 over the name of a prominent economist of the Association of American Railroads, under the title "'Feeder Value' of Tributary Waterways." It is essentially an abridgement of testimony introduced before the House Committee on Rivers and Harbors on May 7, 1946 (pages 331-335 of record of hearing on the proposed improvement of Big Sandy River and Tug and Levisa Forks, Kentucky-West Virginia.) The contents were briefly summarized by the author in the following sub-title:

"Curious reasoning employed by Army Engineers to 'justify' a branch-line river project. Since the venture will cost more than it will 'save', Engineers seek to make the figures balance by imputing main waterway 'savings' to the feeder."

The author goes on to say, in reference to the Engineers' report on the highly controversial Big Sandy River project:

"This is a startling new device for securing economic justification.

*** For this project the Engineers propose to pump in water to make it navigable and also to pump in 'savings' to make it pay."

In 1945, the Board of Engineers for Rivers and Harbors approved the project for improvement of the Big Sandy River for navigation from its mouth in the Ohio River up its two principal forks running through the West Virginia-East Kentucky coal fields. Railroads occupying the banks of the Ohio and Big Sandy Rivers and one bank of each fork were moving a substantial tonnage of high grade coal from these fields to distant industrial markets on the Ohio,

Illinois and Upper Mississippi Rivers and the Great Lakes. Although this business had been going on for almost forty years, no facilities had ever been provided at the Ohio River for the transshipment of this coal to destination by barge. Waterfront property suitable for interchange tipples is almost invariably owned, occupied or controlled by the rail lines. It has never been the practice of the railroads to surrender freight already loaded into their cars to competing modes of transportation even though a substantial saving in cost of providing the carrier service may be shown. No substantial part of the traffic estimated as prospective to Big Sandy improvement would be in a position to benefit from the existence of the Ohio, Mississippi or Illinois waterways, without construction of this project to provide a navigable access route.

It was planned, therefore, to canalize the Big Sandy and its tributaries for barging coal directly from the extensive undeveloped seams on the sides of the forks not accessible to rail service and thence to distant markets in the same floating equipment by way of the existing Ohio River improvement and its navigable connections. It was found that standby facilities to insure adequate water supply for lockages during the short periods of drought could be supplied either by regulating reservoirs on the headwaters or by pumping the occasional water deficiency into the locks from the pools below them. The choice of pumps was a routine decision based on simple engineering calculations and was a workable feature of minor importance in the general design. The magnitude of the coal reserves and the demand at specific markets along the existing waterway system had been established by survey. Transportation of the prospective tonnage by barge on the Big Sandy and tributaries alone could not be accomplished at sufficient savings to justify the expense of the project, but savings to be realized on the water movement from primary origin to final destination on the interconnected system were indicated as ample. Since it was evident that the prospective movement of this coal over the existing waterways with its consequent savings in transportation costs would not take place at all without adoption of the Big Sandy project, the entire estimated saving was credited to the proposed improvement in accordance with the long-established provisions previously quoted from "Orders and Regulations." The ratio of benefits to project costs were thus computed on the basis of the value of the proposed improvement to the existing waterway system as a feeder.

However, the article continues to reject the principle of feeder value, and in so doing, overlooks the fundamental difference between evaluating an existing interlocked waterway system and measuring the probable effects of an additional feeder to that system. The author states his opinion that:

"The Army Engineers cannot have stopped long enough to think this matter out, in their haste to find justification for the Big Sandy project."*****

"It is a fact also that the Ohio River has other tributaries. The principle should be made to apply to them in the same manner as to the Big Sandy. Let us see what happens in that case."

"For the year 1940 the Chief of Engineers in his annual report on 'Commercial Statistics' for water-borne traffic gives the total vessel traffic on the Ohio River as 29,546,388 tons. In the same year there floated out into that river 'outbound traffic', preponderantly coal, defined as being 'traffic moving from one waterway into another', in tonnage as follows:

	Tons
From the Monongahela	10,908,024
From the Allegheny	1,388,297
From the Kanawha	2,473,340
From the Cumberland	87,484
Total	14,757,145

"If to the above figure there be added the tonnage of sand and gravel dredged from the bottom of the river, a commodity for which no expensive improvements can be or ever have been justified, amounting to 5,257,945 tons, there is a total of 20,014,090 tons to be excluded from the Ohio River. This would leave a total tonnage for its economic justification of 9,532,298 tons."

"On this river prior to the inauguration of the present canalization project in 1910 there was carried over 10,000,000 tons annually of freight traffic, a greater amount than is left to the river after all the expenditures for improvements"

The force of the above comparison is lost when it is considered that, of the 10,000,000 tons using the Ohio River before the present canalization, coal from the same tributaries, together with sand and gravel contributed about the same proportion, leaving a balance of less than half the 10,000,000 tons as originating on the Ohio River proper. A fair comparison for the enlightenment of impartial readers would have stripped the 10,000,000 tons down to 4,000,000 in the same manner that the 29,000,000 was stripped down to 9,000,000 tons. As a matter of fact the 10,000,000 tons moving in 1910 was short-haul traffic handled in old, light-draft equipment over facilities fast becoming obsolete. The Chesapeake and Ohio Railway Company was then extending its main line along the banks of the Ohio, and had the waterway not been modernized it would soon have ceased to be a significant factor in the transportation of the region. As it is now the Ohio River canalization project is a highly successful and profitable improvement with an annual barge-borne commerce of over 52,000,000 tons, much of it long-haul through traffic representing substantial savings above its cost.

Oddly enough the very railroads in whose behalf the article was written, submitted testimony in the same case indicating an opposite view of "feeder value" as a legitimate element of justification. The chairman of their Coal Traffic Committee testified:

"Every coal mine, whether served by the main line or any of the numerous branches and subbranches of those railroads, is accorded the opportunity to compete with every other mine in the group at any and all markets ON EQUAL RAILROAD FREIGHT RATES." (Hearing before the River and Harbor Board, Washington, D. C., November 14, 1945).

In other words, the railroads are glad to build "feeder" branches to productive mines, for the sake of the long-haul business thus brought to the main line. But as they charge only main-line rates, they earn no revenue for service on the branch lines. They justify the expense of their construction to stockholders and the regulatory commissions altogether on the basis of their "feeder value." A vice-president of C. & O. Railway testified at the same hearing:

"It is a long-time policy of the Railway to furnish service by the building of branch lines or short spurs for those who want to develop

coal mines, if they can show that they have the coal reserves in quantity and quality to justify, *** and if they can show reasonable market prospects."

Since the same blanket rates have applied for years to main line and branch line alike, it is evident that branch line construction is financed on the "feeder value" basis.

A review of decisions by the Interstate Commerce Commission involving "feeder value" of branch railroad lines throughout the past sixty years show that the basis is not "a startling new device" nor does it involve "curious" or "fallacious" reasoning. The following are firmly fixed as precedents:

4 I.C.C. 588 (1891). "They (small subsidiary roads) are feeders to the main lines, and help to swell the revenues of those lines. Their profitableness is not to be measured solely by what they earn themselves, but by the increase of business they bring to the main-line."

19 I.C.C. 71 (1899). "These branch lines, however, are operated as part of a great and prosperous system. They are feeders to the main-line and help swell the revenue of that line."

70 I.C.C. 251 (1921). "The chief contention of the applicant, however, is that since the branch-line itself cannot be operated so as to be self-sustaining, it is justified in abandoning the service. *** the showing thus made on the system as a whole negatives the applicant's contentions ***."

86 I.C.C. 264 (1924). "It is not expected that the extension will be profitable in itself, but as a feeder of the Union Pacific system, it will probably earn a fair return on the investment."

99 I.C.C. 432 (1925). "The applicant states that the proposed extension will probably not be profitable in itself, but only as a feeder for its system, ***."

150 I.C.C. 126 (1929). "It is not expected that the extension will be profitable in itself, but it is claimed that its utility as a feeder line justifies construction."

The same principle, recognized by the Engineers in their report on the Big Sandy project, would seem to have ample support by transportation authorities.

Senator Overton, Chairman of the Senate Sub-committee on Commerce, referring to the nation-wide scope of the waterways program, at a hearing on the Red River project in 1946, called particular attention to the prospective feeder value of the Red River canal:

"By the very nature and magnitude of the work, individual projects going to make up the (nation-wide) comprehensive development program have to be proposed, analyzed, adopted and prosecuted piece-meal. Each waterway extension, enlargement, feeder branch, or inter-connection adds to the efficiency and usefulness of the whole system. Through the construction of the proposed Red River canal, for instance, its tributary area will be connected with practically the entire inland waterway network of the nation and will share in the benefits of public expenditures already made in all other parts of the country. Similarly, the regions already provided with water transportation will benefit by the added accessibility of the markets and sources of raw material of the Red River area. I am reliably informed that the increase in average length

of haul by inland river barge from year to year has kept pace with the progressive extensions and betterments that have been made, - the increase in the past 15 years amounting to about 75 percent. Furthermore, the extension of the waterway system brings in its wake the extension of joint, barge-rail and barge-truck transportation that extends the benefits of low-cost water carrier service to expanded belts of territory not directly accessible to barge service."

Competition

The ton-mileage of freight transported on the inland waterways is only about 6 percent of that carried on the railroads of the country. The fluctuation in rail ton-mileage from one year to another averages several times as much as the total annual ton-mileage of waterway commerce. If the waterways were shut down and all waterway freight that the railroads could handle were thrown to them, it would not make nearly as much difference in their revenues as the normal annual fluctuation. Nevertheless, the chief opponents of the Federal waterway improvement program are the railroads. Their position is readily understandable when it is recognized that they have to pay for their roadways whereas the waterway carriers do not. Because some of their competitive practices are termed uneconomic in this paper, this does not mean to imply that they are unlawful or reprehensible in any sense. Along with the Federal Coordinator of Transportation the author believes their practices are often detrimental to the public and sometimes injurious to themselves. He finds that: -

"When a waterway is open, immediately competing modes of transportation, particularly the railroads, reduce their rates thus depriving the waterway of traffic which it would otherwise carry."

"The public gets the benefit of those reductions but the waterway does not get the benefit of that traffic; and if you included all the traffic on all the reduced rates for which waterways were responsible, there would be a very different showing

and believes, with the Coordinator:

"that a system of rates based on the cost of rendering the service would be better than any system of competitive rates, for all concerned including the country and its industries."

In their 65th Annual Report (1951) the Interstate Commerce Commission said:

"Reductions to meet competition have been made possible in part by the high level of charges on other rail traffic."

But, in their decision in the 15 Percent Rate Case, Ex Parte 115 the Commission said:

"In their need for increased revenue, the applicants (railroads) have been careful to avoid proposing any increases in rates which have been published to meet the competition of other forms of transportation, **ALTHOUGH THESE ARE THE DEPRESSED RATES WHICH ARE SO LARGELY RESPONSIBLE FOR THEIR FINANCIAL TROUBLES.**"

In addition to the practice of depressing rates between waterway ports on barge-adapted traffic the railroads have adopted another means of discouraging water-borne freight movements. As a rule, a substantial portion of barge

freight either reaches the waterway through a preliminary rail haul, or reaches destination through a final rail haul from the river ports, or both. Although the usually long water component of these joint movements can be performed by the barge lines at considerable saving, this benefit is wiped out if possible by excessively high rates charged on the short accessory and delivery hauls by rail. The high access rates charged by the railroads on coal from the Southern Illinois fields to Alton on the Mississippi River and the high delivery rates on these same rail-barge-rail movements to inland points through the Twin Cities and other river ports on the Upper Illinois and Mississippi rivers are examples which allow but little savings under the depressed all-rail rates on these movements.

The Assistant General Counsel of the Association of American Railroads testified before the Senate Committee on Interstate and Foreign Commerce in 1950, touching on the diversion of traffic from rail to waterway: -

"The loss of revenue from the tonnage actually diverted to the waterways because of Federal subsidy is serious, but it is only a part of the loss suffered from this cause. The railroads also suffer the loss of much revenue BECAUSE OF DEPRESSED RATES THEY MUST MAINTAIN in order to prevent the diversion of a large additional tonnage to subsidized waterways."

"Quotation from "National Transportation Policy" by Dearing & Owen: -

"In the effort to prevent traffic diversion, rates on the commodities that are most vulnerable to competition will tend toward the level of out-of-pocket costs. Revenue required to obtain the level of earnings needed to induce new capital into the industry can then be secured only by increasing rates on the less vulnerable traffic."

As a matter of fact the economic loss from these competitive practices, which is, of course, in the end, passed on to the public, is greater than described by the railroad representative. There is always a substantial portion of any block of traffic, that is not susceptible of attraction to water transportation, but that will seek rail service at normal rail rate levels for various sound reasons unconnected with comparative freight charges. When rates are depressed the railroads suffer a material and unnecessary loss on this kind of traffic, in addition to the tonnage described in the above testimony. It must be clear that, when the rail lines offer these uneconomic rates to potential shippers by water and make up their revenue deficits on noncompetitive movements, elsewhere, they are in effect subsidizing one group of shippers at the expense of the other, just as they accuse the water carriers of doing.

Another basic weakness of this competitive policy is that the mere MEETING of the rate of a low-cost competitor at a non-compensatory level secures no permanent benefit to the high-cost carrier. The only logical objective from the viewpoint of those interested in the financial solvency of the enterprise is to drive out competition with a subsequent return to the old high level or even a higher level to recuperate the losses incurred in the venture. In all these cases the inevitable injury to the public, to whom the bill is finally passed, is manifest. It is the conviction of the author of this paper that a restoration of competitive rates to a normal fully compensatory level would stop a material portion of the losses of the high-cost carriers. The transportation of low-grade bulk freight and other freight adapted to barge movement could profitably be left to the water lines, and the resulting stimulation of industry generally would be reflected in a more remunerative class of business for the high-cost transportation agencies.

The Added Traffic Theory

For transportation agencies of all types to remain in business, their revenues must in the aggregate exceed their expenses. It has been shown that, when confronted with water carrier competition, railroads depress their rates on the relatively small contested portion of their traffic below the full cost of handling it, and shift the excess revenue burden to the large block of non-competitive tonnage that usually makes up the bulk of their business. They seek to justify this kind of rate manipulation on the theory that the added traffic, attracted or recaptured from their competitors by non-compensatory rates, can be transported without incurring a commensurate increase in carrier costs. Their only logical objective would have to be the eventual destruction of the competition through the starvation process, since in the long run, rates depressed below full cost result in a reduction rather than a gain in net profits. The railroads claim to be better off handling the additional tonnage at a loss than surrendering it to a competitor. It is evident that the soundness of the theory depends upon whether the short-term or the long-term effect is under consideration. For the long-term effect it can be shown that the formula is altogether unsound and would not be tolerated in any well-run engineering office.

Take the representative Illinois Central Railroad as an example. Its freight tonnage has increased ten-fold in the last sixty years. Without doubt it was found that, from time to time during that period of expansion, a few more tons could be added to a freight car, or a few more cars added to a train without a horizontal, proportionate rise in the out-of-pocket costs of operation. But the continuing process of adding tonnage throughout the 60-year period has required the progressive addition of trains to the service; increase in the number and power of locomotives; number and size of rolling stock, capacity of terminals, yards and servicing facilities, replacement of light rail by heavy rail, double-tracking, and a corresponding expansion of operating and administrative personnel, and the machinery for attracting and servicing the required capital. All of these additions, betterments, renewals and expansions have been required by the added traffic until at the end it is no longer identifiable. It has merged and become practically all of the traffic, and the out-of-pocket costs per ton-mile have caught up with the full costs.

In his opinion in the 15 percent rate case, Ex Parte 115, Interstate Commerce Commissioner Eastman warned that:

"Carriage for a supposed margin over 'out-of-pocket cost' is becoming the rule instead of the exception, and it will work only as the exception."

Dr. Stuart Daggett in his "Principles of Inland Transportation" points out that:

"Few carrier costs are constant (that is, do not fluctuate with volume of traffic) over long periods, ***."

In his "Economics of Transportation", Dr. Kent Healy finds that:

"The unit cost of additional traffic in the long run may be almost the same as the average over-all cost."

Professor W. Z. Ripley in his "Railroads, Rates and Regulations" refuses to recognize the difference between "added traffic" and normal traffic:

"The moment the old traffic has outgrown the existing plant, the new expenditure becomes chargeable to all the business alike. *** Each ton, both of old and new traffic, beyond the capacity of the facilities then in service, is equally responsible for the expense of the new equipment."

The former Director of the Bureau of Economics and Statistics of the Interstate Commerce Commission in his report on "Rail Freight Service Costs" concluded that:

"In the long run, every item of expense is variable with traffic changes 'although all items' do not increase or decrease in direct proportion."

The usual explanation for assuming the constancy of the unassignable items of carrier expense is the existence of unutilized capacity. As the former Director further states:

"Such explanation may have been justified when carriers were in their infancy ***. However, in an industry such as the railroads, where the original excess capacity with which the carriers started operation has long since been utilized, and the pressure of added traffic during the past 50 years or more has required an almost continuous expansion of their facilities, this explanation loses much of its force."

Nevertheless, the opponents of inland waterway transportation continue to invoke the added traffic theory, unabated, in their petitions for relief from the laws against discrimination. The dangerous extent to which the theory is recognized as valid by the regulatory commissions may be judged from a few instances of rate reductions approved on this principle.

The following example involved the shipment of 100,000 tons of "blackstrap" molasses annually from the New Orleans river port area to Peoria and Pekin waterfront refineries on the Illinois river for processing into industrial alcohol. During the initial period this traffic paid the regular rail rate of \$6.00 a ton, which yielded about 7 mills per ton-mile. Seeking to lower its costs of production, the industry acquired a towboat and fleet of tank barges in which it was found that this raw material could be transported for a cost of \$2.60 per ton, or 43 percent of the rail charge it had been paying. With the intention of increasing the volume of this profitable business this shipper had begun negotiations for the purchase of an additional fleet when the railroads abruptly reduced their rate to \$3.50 a ton, and thence to \$3.00 a ton on train-load lots of the commodity, or three and a half mills a ton-mile. Out of this revenue the carriers had to pay about one mill per ton-mile rental for special tank-car equipment leased to them by the industry. Compared with the average of 9.9 mills per ton-mile then being collected for rail traffic generally this traffic obviously was not paying its share of the rail service cost. But it was sufficient to hold the movement on the rails and forestall the purchase of barge equipment. Meanwhile, the rail rates on blackstrap molasses between intermediate points not accessible to the waterway were held up to the old high level which has since been raised and together with other non-competitive rail traffic, is carrying the revenue burden. The improved river thus lost a substantial block of traffic, which the water carriers could have transported profitably, to rail carriers which could not transport it profitably. Yet this and many hundreds of similar rate adjustments were approved by the Interstate Commerce Commission after thorough investigation.

A more recent typical example of the granting of regulatory authority to the railroads to reduce rates to meet competition between waterway ports while

maintaining intermediate rates at a higher level occurred in Alabama. The rail rate in effect on coal from mines in the Birmingham area to Mobile at the beginning of the proceeding was \$2.55 a ton. In 1950 the Commission permitted a reduction to \$1.28 a ton. The distances varied from 334 to 370 miles, yielding revenues of 3.8 to 3.5 mills a ton-mile, and involved interchange among three individual lines. To intermediate dry-land points averaging 106,294 and 365 miles from the mines, maintenance of the old rates of \$1.55, \$2.80 and \$1.90 was authorized, yielding 14.6, 9.5 and 5.2 mills respectively. In 1943, the Director of the Commission's Bureau of Economics had found the average full cost of moving bulk freight such as coal in hopper cars in the Southern Region was 8.2 mills per ton-mile. The result of this adjustment however was to attract an annual movement of over 300,000 tons of coal from these mines to Mobile by rail, leaving 72,000 tons to travel by waterway.

In March 1951, a decision of the Interstate Commerce Commission (280 I.C.C. 423) authorized reduction in the rail rate on sulphur from Port Sulphur, Louisiana to Nashville, Tennessee, from \$10.20 a ton to \$7.00 a ton to "meet" barge competition. The rail distance is 667 miles. The relief granted authority to maintain higher rates to intermediate points not reached by water service, as for instance \$7.80 a ton to Hurricane, Alabama, only 203 miles from Port Sulphur, and \$10.20 a ton to Prospect, Tennessee, only 577 miles. An earlier case decided in January, 1942, (248 I.C.C. 453) granted a reduction on iron and steel articles from Newport, Kentucky, to Memphis, Tennessee, from \$5.40 a ton to \$3.60 a ton to meet waterway competition. A similar case in August 1941, (246 I.C.C. 516) authorized a reduction on cotton linters from Cairo, Illinois to Chattanooga, Tennessee, from \$5.00 a ton to \$3.60 a ton for the same reason. As in the many other "relief" cases, authority is granted to maintain higher rates for shorter hauls between these origins and destinations that are not subject to competition from the water carriers. A case decided in July, 1949 (274 I.C.C. 589) permitted a still further reduction in a rail rate already depressed to meet water competition on muriatic acid from Weeks, Louisiana, to ports on the Illinois Waterway between Pekin and Chicago, Illinois from \$12.60 to \$9.80. A similar example of a moderate additional reduction in a rate already depressed on account of barge competition was involved in a decision dated in November 1950, (279 I.C.C. 579) permitting further reduction in the rail rate on phosphate rock from Bartow, Florida, to Wilmington, N. C., from \$5.92 a ton to \$5.67 a ton to meet competition from carriers operating on the Intracoastal Waterway while retaining higher rates on shorter hauls to intermediate points not on the waterway. In rationalizing its own decision the Commission commented as follows:

" x x x. On the other hand the record establishes that existing rail-water competition is substantial and compelling and, if increased in intensity, could seriously diminish the all-rail movements. We are of the opinion, therefore, that the establishment of an all-rail rate somewhat lower than the present rate is necessary in order to HOLD A FAIR PORTION OF TRAFFIC on applicants' lines."

In its 65th annual report (1951), the Interstate Commerce Commission observed: -

"As we said in our last report, reductions to meet competition have been made possible in part by the high level of charges on other rail traffic."

Testifying before an Interstate and Foreign Commerce Sub-Committee on S. Res. 50 (1950), the General Freight Agent of the American Barge Line Company remarked: -

"Although the railroads are willing to cut their rates as much or more than 50 percent on traffic moving between the river banks, they are not willing to interchange interior traffic with the water lines even upon the same basis as they do with their railroad connections, unless forced to do so."

A substantial volume of the competitive tonnage will always travel by rail for various reasons other than the scale of charges, so the revenue losses occasioned by competitive rate depression are not confined to the recaptured tonnage. When it is realized that freight held on the rails by such "added traffic" rate reductions, could travel, as provided for by waterway at a profit to carrier and shipper alike, the magnitude of the economic loss to the public as well as to the transportation agencies becomes manifest. A further deplorable result of the form which this kind of competition has been allowed to take is the impression made on various groups of the shipping public throughout the country. It has given rise to the conviction among local interests not served by waterways that the only way to bring down excessive freight rates to reasonable levels is to promote local waterway projects. The Engineers Joint Council included among their recommendations the following: -

"The use of inland waterways as a regulatory agency to force reductions in rates on land carriers should be abandoned."

Since such use has never been contemplated by the engineers, it could not well be dropped from their tenets. Of course there is no valid defense for spending public money on navigation projects merely to regulate freight rates in the public interest, that being, ostensibly at least, the function of the regulatory commissions. The Chief of Engineers, in a letter to the Chairman of the House Interstate and Foreign Commerce Committee, February 25, 1939, with reference to a navigation project report, said:

"My report most emphatically does not recommend the construction of the canal at public expense for the purpose of reducing rail freight rates, x x x."

The above described practices, however, do accomplish an uneven and uneconomic distribution of tonnage among the several agencies of transport, diverting traffic from adapted carriers to unadapted carriers, thus defeating the whole purpose for which low-cost water transportation is provided.

Some particularly pertinent testimony was presented in the Barge-rail rate case (I.C.C. Docket 26712) by the Traffic Manager of the Mississippi Valley Barge Line, a typical victim of competition based on this spurious theory, from which the following excerpts are taken: -

Counsel: "You have referred several times to this question of 'added traffic' basis for justifying rate reductions."

Traffic Manager: "That is another theoretical proposition. It is based on the premise that once a railroad is built, trains are in operation, supervisory staffs are employed, and a certain volume of traffic is moving on normal rates, the out-of-pocket cost of handling additional business is but a fractional part of the full cost." x x x

Counsel: "In computing the so-called out-of-pocket expense, can you state what percentage of the actual expense is ordinarily used as a basis of computation?"

Traffic Manager: " x x x. I have seen where 40 percent was used and I have seen where 60 percent was used. x x x I would say that 50 percent (of full cost) is a fair average of the various amounts used."

In the same proceeding, counsel for the Mississippi Valley Association (of industrial, commercial, agricultural and consumer interests of the mid-continent area) testified in reply to questions by railroad counsel in part as follows:

"If you make money, that would be a sound doctrine, but by making money I do not refer to your so-called added traffic theories and out-of-pocket costs. You cannot make money on such theories as that.
x x x I think the theory is false and illusory all the way through.

R. R. Counsel: "Well, do I understand that the members of Mississippi Valley Association advocate putting the railroads in a place where they cannot meet competition?"

M.V.A. Counsel: "We take this position, that a railroad cannot meet the rates of a lower-cost carrier successfully. The barge is inherently a lower-cost carrier. The railroads can never meet those rates without going below a profitable rate for a railroad carrier."

x x x x x

This thought was expressed in a joint letter from the Secretaries of War and Agriculture and the Chairman of the Maritime Commission, to the Chairman of the Senate Commerce Committee, February 16, 1940, as follows:

"The shipping public is thus lead to forego the real economic benefits provided by the waterways at public expense, and to accept in lieu thereof rail rate reductions which work injury to the railroads themselves. The very questionable advantages which the rail carriers derive from the practice are a depletion of water-adapted tonnage, a consequently misleading rise in waterway improvement costs per ton-mile, and the discrediting of the policy of river improvement by the Federal Government."

The Chairman of the Interstate Commerce Commission, in characterizing the use of "added traffic" rates as a weapon against less favored competitors (in Ex Parte 115, 1937) said:

"It may be used, for example, at the expense of such (exclusive blocks of non-competitive) rail traffic, for the purpose of maintaining an unfair and destructive warfare with competitors who are not fortunate enough to possess such a reserve of exclusive business."

The trouble with this as with many of these sound and forwardlooking pronouncements, it was a minority opinion and did not deter the majority of the Commission, in their zeal to protect the revenues of the carriers from erosion due to these discriminatory practices. However, looking into the future it is not being too optimistic to hope that the fallacy of the "added traffic" theory will become increasingly manifest to the regulatory agencies or that they will be required by legislation to desist from granting relief to carriers invoking this unsound doctrine.

User Charges

Any serious student of transportation must concede that, where rail carriers pay all expenses, including roadway, out of earnings, and water carriers pay nothing for the navigation facilities they use, an inequitable situation results.

The railroads should not be criticized for taking all lawful measures they deem advantageous to their interest in the profitable operation of their own properties, in trying to offset this handicap. The author believes that some of the measures they take are harmful to themselves as well as to their competitors. He is convinced that the corrective most universally advocated - that of imposing tolls on the users of waterways - would, under existing conditions, constitute a remedy worse than the disease.

The determination of whether navigation project costs shall be financed by general taxation; by assessment of the direct beneficiaries; or by other means, is governed by complex policy considerations beyond the scope of this paper. The ostensible objective advanced by those who advocate user charges is reimbursement of the Federal Treasury for outlays made in providing and maintaining the improvements. If this were indeed the governing purpose, the advocates could logically be expected to devise and propose some fair and practical system of collection whose cost of administration would not exceed the revenues, and which would not progressively dry up the traffic of waterways representing public funds already irrevocably invested. Reading between the lines of even the most academic treatise on the subject leads to the conclusion, however, that it is not concern for the taxpayers' money, but for removal of the element of unequal competition inherent in the present system of inland waterway transportation that animates the advocates of tolls. Otherwise no distinction would be drawn between inland river carriers and users of the Great Lakes and coastal harbor improvements. The difference is that the service of river boat lines is within reach of competitive rate adjustments by the surface carriers, while the Lake carriers' costs are inherently too low, and the coastal harbor channels are actually a necessary supplement to rail service.

The General Counsel for the Association of American Railroads in his testimony on the Transportation Bill S.2009, in April 1939 - explaining the inclusion (in the railroads' draft of this bill) of exemptions of Lake and coastal channel operators, said: -

"That particular language was put in with special reference to conditions on the Great Lakes, where the bulk of the tonnage there is carried by contract carriers who are, generally speaking, not in competition with anybody. Grain, ore, stone, coal and some other commodities x x x move in large quantities at relatively low rates which the railroads could never hope to meet."

The Director of Research for the Federal Coordinator of Transportation, in Volume III of "Public Aids to Transportation" presents what is probably the fairest, most intelligent and most objective analysis of the Tolls problem that has been published to date. In lifting passages from his report, out of context, (always a potential source of injustice), this author has attempted to project fairly, the Director's apparent attitude and conclusions toward the practical effect of the imposition of user charges to recover various proportions of the expenditures already made on waterway projects, and those to be made on recommended extensions and enlargements of the system. (Vol. III, p. 120 et seq.).

"Questions of Policy for the Future"

"The Tolls Question. - x x x The following assumptions are laid down:

- (a) That all principles and methods will be laid down uniformly.

- (b) That the newer existing waterway improvements and those now approaching completion will be permitted to develop without tolls
x x x
- (c) That traffic which does not x x x benefit x x x will be excluded.
- (d) That the question of assessing tolls will be considered from the point of view of covering (i) total costs or (ii) the costs of maintenance and operation, only."

"The charging of tolls would (1) contribute to placing the several forms of transportation on more nearly equal competitive terms, lay the basis for a more effective cooperation of the different forms of transportation in the public interest, and lessen trade dislocations that result from competition between self-sustaining and subsidized services.

- (2) promote adequate control and rational planning of future waterway improvements.
- (3) To a minor extent, contribute to the public Treasury funds needed for the general purposes of government."

x x x x x

In mulling over the stated objectives, one is disturbed over the dislocations and discriminations that would inevitably result from acceptance of those recommendations. If user charges were to be imposed commensurate with the cost of improving and maintaining the various channels and locks, as proposed, there would be an almost infinite variation in toll rates, and the cost of allocation, assessment and collection could well exceed the total revenue received. Inland waterway routes are now on a rational competitive basis with rail-lake-rail routes such as Pittsburgh to Minneapolis, and with rail-coastwise routes such as Pittsburgh to Houston. These relationships would be unwarrantably destroyed by the imposition of tolls on one group of carriers and not on the others, when they all were using Federally provided facilities. So far no workable system for avoiding these discriminations has been proposed by the advocates of user charges.

"In a memorandum to the Federal Coordinator of Transportation from railroad representatives the following suggestion was offered: -

"The Association of Railway Executives recommends that charges be assessed against all commercial users of improved waterways TO COMPENSATE TAXPAYERS FOR THEIR INVESTMENT IN SUCH WATERWAYS AND FOR AMOUNTS WHICH HAVE BEEN EXPENDED FOR ADMINISTRATION, MAINTENANCE, AND OPERATION. To this end we propose that Congress provide by law that navigable inland waterways be made self-supporting and self-liquidating; that tolls should be provided for the use of the IMPROVED NAVIGABLE INLAND WATERWAYS of the United States when commercially used'

x x x x x

'There is no thought in the minds of the Association to suggest tolls so heavy as to destroy the traffic; x x x'

The National Industrial Traffic League at its annual meeting in November 1933, went on record as opposing "the assessment of tolls unless and until an exhaustive investigation indicates that such tolls are necessary and desirable and will not act as an estoppel against water-borne traffic."

The representative of the Association of American Railroads before the Senate Committee in the hearings on Senate Resolution S-50 (1950) testified in part as follows:

"The railroads do have a rightful basis for complaint when, as here, the inroads (on rail freight traffic) are due to artificial advantages resulting from subsidies to inland waterway transportation.

"Since no user charge of any kind or description is imposed for the use of inland waterways, the entire (Federal) expenditure for new work and for operation and maintenance on rivers and canals constitutes a subsidy x x x."

The Presiding Officer: "Those expenditures also aid the railroads to a certain extent. Do you get a portion of that share?"

Answer: - "From the Seacoast harbors and channels?"

The Presiding Officer: "Yes"

A.A.R. Representative: "That is correct, sir."

At least five bills have been introduced in the past 15 years proposing tolls for the use of improved inland waterways, all of which have died in the legislative mill.

"Public Aids" - Federal Coordinator, Vol. III, p. 206.

"Only if the carriers were subject to tolls adequate to carry the costs reasonably assigned to them could they demonstrate what water transportation is able to do and begin a reckoning of true savings. IT IS ONLY TOO OBVIOUS FROM THIS REPORT THAT IF TOLLS IN SUCH AMOUNTS WERE ASSESSED A LARGE PART AND IN SOME CASES ALL OF THE TRAFFIC NOW CARRIED ON VARIOUS OF THE RIVERS AND CANALS WOULD DISAPPEAR."

x x x x x

"Competition between public capital and private capital x x x cannot be brought under sensible control until the railroads' competitors are forced to meet the same kinds of costs the railroads themselves do, or some balancing favor is given the railroads by the Government."

The above pronouncements bring into prominence an attitude evinced in varying degree by all opponents of inland waterway development. On the one hand, they advocate the imposition of tolls on the users of inland waterways, "to the end that the United States be reimbursed for its expenditures on inland waterway projects", but on the other, voice the opinion that such action will drive a large portion of the traffic off the water. In that case, obviously the stated purpose would be defeated.

The author of "Muddy Waters" advocates user charges on waterways as a sound water development policy, sound transportation policy, and sound general national policy. He lists among those advocating tolls the Interstate Commerce Commission, the President's "Committee of Six" (railroad executives), the National Resources Planning Board, Dearing & Owen in "National Transportation Policy", and the Secretary of Commerce. He claims that it is a sound, established fiscal policy generally to require recipients of special economic benefits from governmental activities to pay directly, "at least in part" for those benefits. He states that by placing the burden of waterway costs directly on those who use the facilities, the collection of user payments

would "tend to promote sounder planning of waterway projects", and "greater care in the prediction of benefits from proposed projects."

Alone, among the many treatises advocating user charges, "Muddy Waters" recognizes the present unsatisfactory competitive situation, but dismisses the dangers in the situation that would be created by the imposition of tolls with scant consideration. It concedes that: -

"To compete with subsidized water transportation, the railroads, subject to whatever limitations are imposed by regulatory agencies, often depress to an uneconomic level their rates on freight that competes with waterways. They 'lose' money on these out-of-pocket-costs rates, but make up the loss by charging higher rates on freight for which there is no water competition."

None of the many economists who propose the imposition of tolls appear willing to face squarely the situation as it would be if their recommendations were to be followed. The imposition of tolls on waterway commerce without positive legislative protection of the water carriers against destructive rate cutting by the more firmly entrenched rail carriers would probably end in complete elimination of barge service from the inland navigation system. The reason lies in the uneconomic competitive practices of the overland carriers and the lenient attitude of regulatory agencies toward these practices. There can be no fair and workable application of user charges to waterway transportation unless and until a rigid cost-of-service basis of competitive rates is imposed on competing agencies as far as the contested traffic is concerned. Railroads, because they go practically everywhere and transport all kinds of freight, can handle any commodity movement available to any of the other modes of transportation. Under the prevailing system, they can and do depress their rates, frequently below the actual cost of handling, on any particular block of competitive traffic they choose to select for attack, and raise their rates proportionately on other traffic out of reach of their restricted competitor. Boat lines have no such blocks of exclusive, non-competitive traffic within the limited scope of their transportation activities upon which they can shift their revenue burden through higher rates. All of their freight movements must carry their full share of the total expense of transportation if the water carrier enterprises are not to collapse.

If tolls are imposed upon such operations such taxes would have to be passed along to the shippers and through the shippers to the ultimate consumers of the goods in proportionate additions to each rate. It is clear that, under the competitive conditions just described, these water lines would be at the mercy of competitors possessing diversified traffic and could be eliminated from the field, one by one, by selective rate cutting.

"Muddy Waters" evinces little concern over this state of affairs, merely setting forth: -

"If the collection of tolls were not to eliminate uneconomic rail rates automatically, then it would be the responsibility of the Interstate Commerce Commission to compel railroads to establish rates that truly represent their relative economies."

There is nothing in the long record of rate decisions by the Commission that would offer any assurance of protection from that source. The railroads, themselves, have maintained that they cannot set individual rates at cost. The Commission has always permitted the railroads to establish low rates where waterway competition could be shown, permitting the maintenance of higher

rates on shorter intermediate hauls not subject to competition. It is only when the courts intervene, as in the Ex-Barge Grain Case (1943) that the barge lines can obtain some measure of protection against discriminatory rate cutting.

In the dissenting opinion of Justice Black of the U. S. Supreme Court in the Ex-Barge Grain Case (319 U. S. 671) is an illuminating quotation:

"The District Court, which held that the Interstate Commerce Commission's order 'discriminates against water competition by users of the barges' understood the issue. The railroads which proposed the increase in the cost to barge shippers, also understood the issue as is shown by the frank statement of their representative at the Commission hearing: -

'We made this proposal, as I have stated several times, and filed these tariffs with the hope that we could drive this business off the water and back onto the rails where it belongs x x x We are not in love with water transportation x x x and we believe we are entitled to that grain business.'"

The decision of the Court, however, required the I.C.C. to reverse itself and protect the barge users from discrimination.

The attitude of the competitors of waterway transportation was well understood by the Chairman of the Interstate Commerce Commission as set forth in his dissent to granting the railroads the right to establish obviously non-compensatory rates in the Petroleum Products case (194 I.C.C. 31) 1933 - in which the railroads sought to reduce their rates below cost to regain traffic that had been lost to barge lines:

"This promises to be a return to a policy of railroad rate-making which existed for many years x x x. The railroads in their early years encountered stiff competition from steamboat lines x x x and they proceeded to meet this competition ruthlessly. Eventually they swept the waters clean of competing craft except on the ocean and Gulf, and even there the competition was greatly weakened.

"This was done by cutting rates where competition existed, to whatever extent was necessary to paralyze it, at the same time maintaining rates at a very high level elsewhere. The steamboats did not have this reservoir of non-competitive traffic (upon which to shift the revenue burden of a rate war) to help them out, and hence perished in the unequal struggle. x x x All of this made, of course, for a very uneven development of the country, and it was one of the main factors which precipitated the creation of this Commission."

In 1939 in testimony before the House Committee on Interstate and Foreign Commerce on the Interstate Commerce Bill, the Vice President and General Counsel of the Association of American Railroads defined the attitude of the railroads toward any regulatory attempt to prescribe rates on a cost-of-service basis. He proposed that the wording of the act require that, **ONLY IN THE AGGREGATE** must the rates of railroads meet their revenue requirements. It is at once apparent what they could do, with that leeway, in adjusting their rates to competitive conditions. He quoted a proposed provision in the draft of the bill that was later eliminated: -

"It (the Interstate Commerce Commission) shall give due consideration to the undesirability, in the public interest, of permitting any carrier to establish and maintain any rate, fare, or charge **WHICH IS THE SAME AS, OR LESS THAN, THE FULL COST OF PERFORMING THE SERVICE.**

The A.A.R. Counsel continued: -

"Now, we think that, with great deference of course, we think THAT AN OBJECTIONABLE AND DANGEROUS THING to undertake to give so much emphasis upon the full cost of performing the service."

x x x x x

"You cannot make rates on that basis, although many thoughtful students have endeavored to do so. It is impracticable. It is impossible to find the proper figure and impossible to apply it if you found it IN VIEW OF THE COMPETITIVE CONDITIONS WE HAVE.

In continued hearings on the same bill, Counsel proposed a rate-making rule containing the following language: -

"We (the railroads) propose, therefore, a rate-making rule to read as follows: -

'It shall be the duty of the Interstate Commerce Commission x x x to permit the establishment x x x of RATES WHICH, AS A WHOLE, WILL BE ADEQUATE, etc. x x x.'

It is difficult to believe that the railroads, with their fully detailed statistical records and their elaborate facilities for research, do not actually know within reasonable approximation what their costs are. It was made abundantly clear in the prolonged hearings on the Class Rate Case (I.C.C. 28,300) that they do not relish having such costs established for official use (and possible misuse), and such an attitude is readily understandable. The Bureau of Economics and Statistics of the Interstate Commerce Commission, however, has compiled from railroad records and keeps reasonably current, a voluminous set of tables entitled "Rail Freight Service Cost Tables", an analysis of the varying costs per ton-mile of handling and transporting over 700 different commodities in the various freight territories. These cost figures are based on the relative use characteristically made, by each kind of commodity, of available rail equipment and facilities. Some elements of cost have to be prorated on a more or less arbitrary basis but the method has received the acclaim of traffic men in general, and is being relied upon to an increasing extent by the Interstate Commerce Commission in important decisions involving the justness and reasonableness of rates.

This cost-finding system has been applied by the engineers to the detailed statistical records of representative barge line operators on various sections of the waterway system and in various kinds of service. A set of base costs has thus been compiled for modification to fit any specific set of conditions expected to be encountered on individual waterway projects, and for comparison with the "Rail Freight Service Cost Tables" described above. The general acceptance of the cost basis by traffic and transportation specialists as a yardstick for measuring the reasonableness of rates, and the tendency toward greater reliance upon it, even by the regulatory agencies, is encouraging. The engineers look ahead with some confidence to an eventual legislative ban on the system that now permits rates to deflect tonnage from an economical to an uneconomical agency of transport, in the public interest.

In "Muddy Waters", page 165, is a fairly accurate statement of the engineers' position, paraphrased from "Rationale of Inland Waterway Transportation" prepared under the direction of the Chief of Engineers in 1940 as follows: -

"Cost of service is not the governing factor in fixing the rates of competing railroads. Railroads establish uneconomic rates (out-of-pocket-costs rates) on freight that competes with waterways.

"The effect of such differential rating is to keep freight that economically should travel on waterways, on the railroads instead, because of the better service which railroads can offer. Therefore, waterways are not used to the extent they should be, economically, and as a result, unit costs are relatively high.

"The most disastrous effect of the current system of permitting high cost, high grade carriers to compete with low cost, low grade carriers for low grade traffic, is the diversion from waterways, without profit to anybody, of traffic which they could serve adequately, and economically. In thus curtailing water-borne tonnage it produces misleading unit cost statistics applied to the provision of channels and locks - statistics which are used with skill and effectiveness by opponents of the national waterway policy.

"For these reasons, at least until such time as water-borne tonnage is allowed to swell to the predicted volume when permitted freely to seek water routes, uninfluenced by competitive rail rate depression, **IMPROVEMENT COSTS SHOULD NOT BE INCLUDED IN COMPARATIVE RATE FIGURES FOR ECONOMIC JUSTIFICATION, AND TOLLS SHOULD NOT BE CHARGED.**"

It could be wished that the text had been quoted, verbatim. The rearrangement in the capitalized portion of the last sentence says in effect that improvement costs are disregarded in determining economic justification, and that tolls should not be charged under any circumstances. This impression, created by the writings of various opponents of waterways, has certainly lodged in the minds of the public.

"Muddy Waters" contains this final blast at the engineers' procedure: -

"If water rate figures used in survey reports were revised to include both carrier costs and public improvement costs, the economic justification for any project would be determined by a simple comparison of rail and water rates. That is, assuming the water rates to be lower, the differential between the two rates would be multiplied by the amount of traffic (in ton-miles) which, after a development period, could be expected to move if asked to bear full costs. This would not give the same result as the Engineers now obtain by establishing a ratio between the annual costs of a project (derived by amortizing the investment and adding annual maintenance costs) and the annual benefits (derived by comparing rail rates to subsidized water carrier rates), for the simple reason that estimated volume of traffic is likely to be much greater where the rate comparisons are based on the lower subsidized water rates, which include no allowance for waterway improvement costs.

"In the second place, even if the present rail rates are already uneconomically depressed, or if it is feared that an uneconomic reduction in rail rates after a project is built will adversely affect its economic justification then the duty of the Chief of Engineers as a public servant is not to recommend the construction of additional costly water projects on a justification which fails to include in water rates the public costs of improvements, but to estimate the traffic distribution which will result from rail and water rates, both based upon full cost of service, and then, if the project appears justified, to recommend its construction and at the same time to recommend that the railroads be made to establish fully economic rates by regulation if they fail to do so on their own accord."

The engineers have ample reason to doubt the possibility of any effective protection of waterway traffic against rate-cutting raids, through regulation. They include annual charges covering interest, amortization, maintenance and operation of navigation facilities among the costs to be offset by transportation savings in measuring their economic justification. They do not add hypothetical tolls to the water rates because Congress has flatly rejected tolls in as many as five bills introduced in the last 15 years. It may be assumed from the record that Congress does not intend to impose tolls for the valid reasons set forth in this paper. If and when Congress adopts tolls by legislation, the engineers can naturally be expected to modify their formula accordingly.

Regulation

Until the 1940 Transportation Act was passed the regulatory commissions applied but little restraint on the operations and charges of the inland waterway carriers except in the control of joint rates on through rail-water routes. That act placed common and contract carriers under varying degrees of regulation with respect to rates and certificates or permits to conduct business. There was united opposition to these provisions on the parts of all of the several types of water carrier-coastwise and lake carriers as well as those engaged in the transportation of heavy bulk commodities on the rivers and canals. Apparently through the strategy of divide and conquer, the opposition of the bulk carriers was disposed of by granting them exemption from regulation. Soon after regulation of common and contract carriers was put into effect, the Interstate Commerce Commission began to find itself handicapped because of the competitive operation, side by side, of both regulated and exempt inland barge lines. The groundwork has been laid for promoting legislation to embrace the bulk carriers by water also under regulation. The Engineers' Joint Council report includes a recommendation to that effect. The test of physical adequacy of existing carriers to handle present business customarily applied by the regulatory agencies to new petitioners for certificates to operate can but have a stultifying effect on the free growth of commerce on recently opened waterways.

The National Transportation System

Another recommendation popular with theorists in the field of traffic economics is that all navigation improvements should be susceptible of being fitted into what they term the "National Transportation System" to advantage, in order to be justified. Like most other theories this one has a reasonable sound. The criteria observed by the engineers in investigating the merits of all projects calls for an appraisal of existing transportation facilities of all types in the area tributary to the proposed waterway and the net contribution it can be expected to make toward proper disposal of the local transport needs. But that is not what they mean. They mean that if there is already a physical adequacy of transportation, no matter how improvidently conceived, or badly managed or expensive, or obsolescent, an economical waterway should not be introduced into the "System" unless the weakest of the existing transport agencies are either supported in relative idleness or paid to stand aside. That is the theory under which the existing carriers have successfully opposed the Riverlake Belt Conveyor scheme for moving ore and coal between Lake ports and the Pittsburgh-Youngstown steel-producing area. Ten years ago they successfully opposed the crossing of their rights of way by the oil pipe line from

a Gulf port into the Southeast, until the exigencies of war disposed of their opposition. It is a position, entirely comprehensible from the standpoint of the ownership of existing facilities, but, if generally adopted it will deprive the country of most efficient and economical transportation for certain commodities needed in great volume by basic industries.

One fundamental shortcoming of this doctrine is that there IS no National Transportation System. That is, factually speaking, there is not any logically planned, coordinated organization of carriers of all types to take care of the national freight burden in the most efficient and economical way. The existing carriers have grown and spread and joined in response to the needs of commerce, and while they might have done better, they haven't done badly on the whole. The plant, such as it is, needs both cultivation and pruning - some of the branches are drying and dropping off and others are growing where they seem to find sustenance. Parts of the country are still undersupplied with transportation while other parts seem to be oversupplied, but they seem to respond eventually to the law of supply and demand.

There are railroads that are favorably located, suitably designed, well managed and prosperous, rendering an indispensable service to the public at reasonable rates. Others successfully attract a large enough share of the commerce to remain solvent and useful without being able to recompense their owners with much of a return on their investment. Still other ventures, unsoundly launched in the first place, are poorly supplied and maintained, exploited by their creditors, constituting a drain on their financial backing, and contending for traffic which one of the sounder companies could more profitably handle. According to the integration theory however, all of these existing agencies, good and bad, must be sustained in "healthy financial condition" by holding freight rates high enough to allow them a profit. That was the theory of the Interstate Commerce Commission in its adverse report on the Lake Erie-Ohio River Canal, (235 I.C.C. 753 - 1939), with respect to the probable effect of the proposed canal on the existing carriers between the Lake and the Youngstown-Pittsburgh area. It said:

"Included in these lists are carriers which will be recognized as basically strong and others whose present condition is very bad and whose long-term outlook is unfavorable."

Yet it was held that all of these carriers should be maintained in financially sound condition, even though the steel industry in the East and the coal-using industries in the West had to go without a more economical and efficient means of transportation. It is not apparent to the author of this paper why those carriers whose condition and outlook were bad should be maintained in service at a loss any more than that the old Mississippi River channel over Chain-of-Rocks should be maintained after the more efficient by-pass canal is opened to navigation. If the entrance of an efficient and economical waterway into the field creates a surplus of carrier facilities, it is in the interest of a healthy transportation plant that the most costly and inefficient units be displaced and traffic be distributed among those agencies that can render the required service at reasonable rates. There would not seem to be any logical obligation on the general taxpayers or shippers to forego the benefits of economical water transportation in order to maintain a wasteful and inefficient competitor in business.

Legislation

Three bills having important bearing on the future of waterway transportation are pending in Congress. The significance of two of them, imposing tolls on water carriers, and abolishing restraints on the competitive depression of rates, has already been pointed out. The third provides that final determination of the public necessity for providing and maintaining waterways shall be vested in the Interstate Commerce Commission. This paper is not concerned with the questions of policy involved in pending legislation, but whether the proposals can be made to work out in actual practice. Drafters of this bill have inserted some odd provisions which seem incompatible with the practical attainment of the stated objectives. For one thing the economic investigations by the Corps of Engineers and the Commission are not to be coordinated as might be expected. The Corps of Engineers must complete its surveys and reports and make its recommendations before the project is referred to the Interstate Commerce Commission. The Assistant General Counsel of the Association of American Railroads in presenting the proposal before a Senate Committee said:

"Both because of the experience and qualifications of the Commission and because of its broad responsibilities in the field of transportation, the determination of whether additional waterway facilities for navigation proposed should be constructed is one which should be vested in the interstate Commerce Commission." x x x

A further shift of responsibility is contemplated by this witness: -

"The policies with respect to the improvement of inland waterways are essentially a part of our national transportation policy. Accordingly we believe the Congress might well give consideration to the transfer of jurisdiction over inland waterway navigation projects from the Committees on Public Works to the Committees on Interstate and Foreign Commerce, the latter being the ones charged with the responsibility for transportation problems generally."

The sponsors of these bills are evidently not interested in the fact that the improvement of inland waterways is likewise essentially a part of our national water resource development policy under the jurisdiction of the Committees on Public Works. That the conflict might be awkward is borne out by the following stipulation in the bill (S-2744) which finally emerged from the Senate Sub-Committee on Interstate and Foreign commerce in February of this year: -

"No Federal project for the improvement of any inland waterway designed, IN WHOLE OR IN PART, to aid navigation shall hereafter be undertaken, nor shall any Federal funds be expended on or allocated to any project HERETOFORE AUTHORIZED by the Congress but construction of which is less than 25 per centum complete, x x x until the Interstate Commerce Commission after full hearing shall have submitted a report as hereinafter provided concerning justification and the public convenience and necessity for the transportation features of the project."

This provision obviously applies to multiple-purpose projects featuring flood control, hydro power, irrigation, drainage, with navigation features of possibly minor importance. It is apparent what the proposed procedure would do to a project like the Columbia River valley improvement. According to the bill it would proceed as follows: -

"Whenever a detailed survey of a proposed inland waterway improvement project designed, IN WHOLE OR IN PART, to aid navigation, HAS BEEN MADE, and the report based on said survey shall contain a recommendation in favor of such project, said survey and report shall be submitted by the Chief of Engineers, United States Army, to the Interstate Commerce Commission for investigation and report as hereinafter provided. x x x Upon receipt of the report of the Interstate Commerce Commission, the Chief of Engineers shall submit it, together with the engineering survey and report, to the Board of Engineers for Rivers and Harbors for its review and recommendation."

Taking into consideration the procedural machinery of the Interstate Commerce Commission and the average time it requires to process transportation cases of similar scope, it is doubtful whether a full report on any important project could possibly reach Congress while the original survey data were still current.

The bill contains other interesting provisions. The report which the Interstate Commerce Commission will receive from the Chief of Engineers will already embody a complete economic analysis of the project supported by the necessary canvass of potential users and competitors in the field, data secured through the usual public hearings, waybill and commodity studies, rate analyses and computations. The Commission is then to institute a similar investigation of the same sources to determine the present or future public convenience and necessity; it must publish notice of the investigation in the Federal Register and serve a copy of its order, with description of the nature and location of the project, upon all carriers which might be affected. It must afford opportunity for fair hearing to all parties having an interest therein. All of this will have been done by personnel of recognized competence in the prior survey by the engineers.

"It shall have the power on its own motion, and it shall be its duty upon proper application and showing OF ANY PARTY AT INTEREST, to require BY SUBPENA the attendance and testimony of witness at the hearings on said investigation, including the engineer or engineers who prepared the report upon which the investigation is based and the production of the records and documents relating to matters pertinent to the purpose of the investigation."

National Defense

The value of waterways to national defense has been ably demonstrated in the paper of the President, American Waterways Operators and the instances he cites are convincing. There are, however, certain other elements of national security value that merit consideration in the intervals between wars. Before World War II, opponents naively claimed that, because railroads, motor trucks and pipe lines were also capable of performing service valuable to the security of the country, no recognition should be accorded waterways for their unique role in national defense. That premise completely ignored the impending shortage of all means of transportation, as succinctly conceded by the National Resources Planning Board in its "afterword" to the report on "Transportation and National Policy" May 1942:

"What once plagued us as a surplus of transportation facilities, we must now recognize as a grave shortage that imperils the attainment of war production goals. x x x The nation is fortunate to have at its

disposal in the present emergency the great increase in facilities of all kinds which seemed so disturbing in 1932."

In view of that candid admission, it would be unfair to quote the following passage from the body of the same report, were it not for the deterrent warning to be drawn from it for our future guidance. The earlier passage reads:

"There no longer exists either a general undersupply of transport facilities or a deficiency of other controls. x x x Defense objectives cited on behalf of transport promotion, however, have in the past been more often a high-sounding phrase invoked to obtain funds, than a disinterested desire to preserve the Nation, and the same applies to many current pleas for defense funds."

No nation can long maintain transportation facilities on an all-out war footing that do not also fit into a peacetime economy. Conversely, it is even more dangerous for a nation to attempt to maintain its transportation facilities - especially its rivers and harbors - on a scale that is suitable only for a peacetime economy. The occurrences of the past twelve years have emphasized the kind of peacetime economy that will be adequate for its own continuation in the only kind of future that, it can be safely hoped, will eventually materialize.

More than three years before the involvement of the United States in World War II, the Chief of Engineers of the Army in a public address had called attention to the military importance of inland waterways in the following words:

"Let us examine for a moment this great inland waterway transportation system in the event of a national war emergency. The lesson of 1918 should be remembered. x x x The development of improved interconnected systems places us in a far better position today. I visualize tremendous use of this inland system during any future war."

The trouble was that a recurring peacetime philosophy that wants to get away from unpleasant thoughts of war had the public in its grip in 1938. Peacetime economies prevailed. The situation is well described in an editorial in the magazine "Waterways" for March, 1943.

"In May of last year Hon. Clyde Read, Transportation authority of the U. S. Senate, was warning that body that:

"We are in a critical hour so far as transportation is concerned x x x. The critical outlook for the movement of coal next fall and winter cannot be overestimated."

But three years prior to that ominous pronouncement Senator Reed was not yet worried about the impending scarcity of transportation. He was assuring the National Industrial Traffic League that:

"The United States has a surplus of commercial transportation facilities of all classes. x x x As long as I am a member of the United States Senate, I shall oppose this inland waterway racket."

At about the same time a vice-president of the Association of American Railroads was making the following public statement:

"The action taken at the meeting of the railway executives in Washington on September 19, 1939, much in the same manner as that of 1923, and the results accomplished since that time, have proven conclusively that the railroads can meet any demand for transportation, present or prospective, that may be made."

The Director of the Office of Defense Transportation, in September, 1942, sent out the following plea to the traffic organizations of the nation:

"Those of you who deal with transportation can make a substantial contribution to the war effort if you will use the inland waterways to the greatest extent possible, thereby relieving other transportation systems."

But this same official, as Chairman of the Interstate Commerce Commission, in 1939, had said:

"It would be more economical for the Government not to construct and maintain the waterways but instead to use an equivalent amount of money as a subsidy to the railroads in exchange for lower rates."

The editorial continues with the following observation:

"The point is that these civil officials are not and were not conscious obstructionists, but on the other hand exceptionally able and patriotic men, performing, within the scope of their special knowledge, talents and training, a splendid and indispensable service to the nation at this critical time. They simply were not thinking of war. Nevertheless, it is equally obvious that if the policies advocated by them between wars had been followed we would be entirely unable to carry out their present recommendations."

There is, furthermore, another aspect of national security value, largely economic in character that should also be given consideration. In the 176 years of our national existence this country has been at war eight times for a total duration of 25 years, or practically one year out of each seven. The present world outlook certainly does not offer any assurance of a more favorable future ratio for a long time to come. Any set of conditions that occurs so frequently for such long periods must be recognized in our permanent national economy. The sinking of coast-wise vessels during World War II in a service that could have been replaced through protected waterways was not just an isolated catastrophe that threatened the success of our military effort. Twice in 23 years we have had to replace those costly vessels and their cargos, with what can be considered an expanding sequence of recurring expense.

The allocation of steel for the construction of coal barges and tank barges was sought by the Director of Defense Transportation in the early months of World War II but the War Production Board did not even acknowledge the request for more than eight months. Good dry-cargo barges were converted into poor tank barges and their normal useful life curtailed to the duration of the war. Wooden tank barges totally unfit for peacetime operation had to be built as a temporary wartime expedient. All of these losses are susceptible of being placed on an annual cost basis and charged to the peacetime lag in providing waterway equipment and facilities. As the Waterways magazine editorial concluded:

"Clearly we cannot expect to utilize waterways in war time if we neglect to build them in peacetime."

With reference to the future peacetime need of facilities found so useful in war, even the Interstate Commerce Commission conceded, in its sixty-third annual report (1949), conceded that:

"In the 4 years since the close of armed hostilities, it has become increasingly clear that the peacetime economy of the country will require

most of the transportation facilities which were believed, ten years ago, to have been provided too far ahead of the traffic."

Again the estimates of the engineers, made in the face of the vociferous dissent of the economists, are found to be vindicated by time.

Conclusion

This paper has attempted to counter some of the protests of opponents of waterway transportation against the administration of the improvement program. It is realized that many live aspects of the subject have not been touched upon and that there is room for wide divergence of opinion about those that have been discussed. It is hoped that at least some light has been thrown on obscure facets of the problem of determining justification of Federal projects.

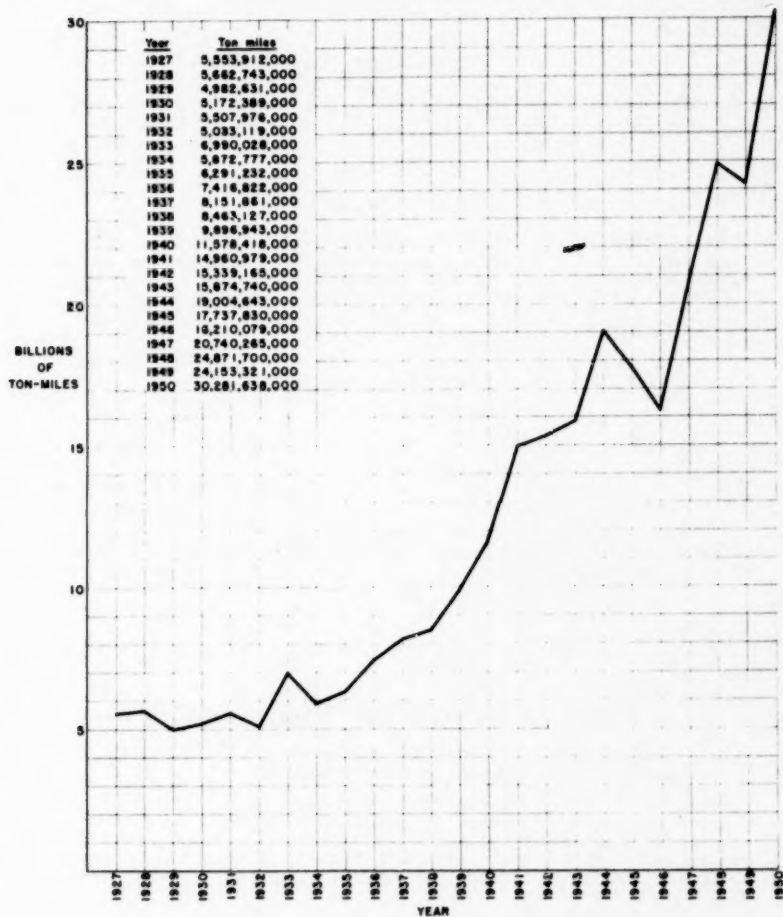
The field survey and office analysis processes have been briefly outlined, and the efforts to staff the Board with qualified specialists described. The complications arising from conflicts among transportation interests have been detailed and the basis adopted for evaluation of navigation benefits explained. The bearing of waterway development on national security has been touched upon in its predominantly economic aspects, and the significance of pending legislation interpreted from the standpoint of the general public interest. The vital role which the waterways are playing in the national economy has been demonstrated.

The paper has also attempted to bring light to bear on the sources of some of the most widely held, popular misconceptions with regard to the manner in which waterway projects are tested for economic soundness. To the allegation that the public costs are customarily ignored in comparing water carrier service with other modes of transport, the authorized routine procedures followed in evaluating proposed improvements have been set out in detail in contradiction to this structure. Published project reports on all major improvements of the last two decades furnish corroboration. The allegation that forecasts of tonnage for waterway projects are uniformly overly optimistic is refuted by the tabulated performance records of the principal component sections of the waterway system, previously recommended by the engineers. The validity of savings in transportation charges is supported by comparison of service costs, including estimated toll charges potentially assessable against users of the inland waterways. The discouraging effect of prevailing competitive practices on the growth of barge-borne traffic, now sanctioned by the regulatory agencies, has been diagnosed and prescribed for. The essential unsoundness of the "added traffic theory" of rate-making has been explained and the self-defeating element in a tolls system exposed.

It is difficult to coordinate the development of the water resources of the country for the various desirable objectives so as to obtain the maximum net benefit for all concerned. It is difficult to coordinate the various elements of the national transportation plant so that the freight burden may be most efficiently and economically handled to the end that commerce and industry may be wholesomely promoted. It is doubly difficult to coordinate both of these general purposes into a single program. There is only one field in which both programs impinge one upon the other and that is the field of inland waterways. None of the many articles, reports, or books of individual authorities or commissions that have lately flooded the publishing houses and printing plants has even attempted to offer a workable formula for the solution of these conflicting objectives. It is the conviction of the author of this paper that over-all planning

for the future and adherence to an accepted plan will go a long way toward simplifying these vital problems. But in the end the projects are going to have to be approached piecemeal, with the most thorough possible analysis of their relation to the over-all task, by experienced engineers of proven knowledge and judgment in both fields.

TON-MILES OF INLAND TRAFFIC ON MISSISSIPPI RIVER SYSTEM, 1927-1950



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